Original

ORDER NO. KM49206145C1
F1

6300

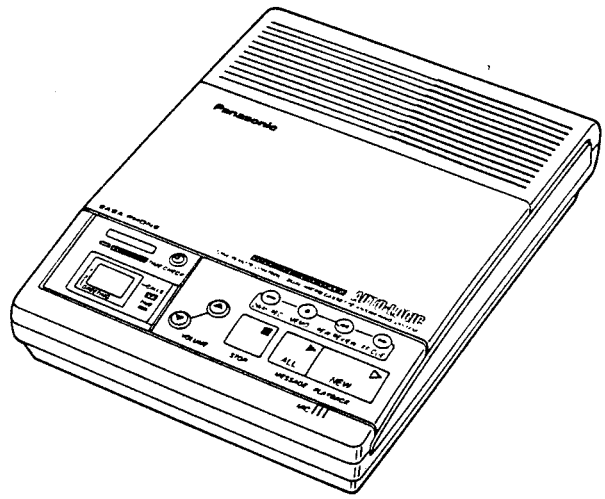
Service Manual

and Technical Guide

AUTO-LOGIC™
EASA-PHONE®
AUTOMATIC TELEPHONE
ANSWERING SYSTEM

Telephone Equipment

KX-T5100



■ SPECIFICATIONS

Power Source:	AC adaptor (12 V, DC)/KX-A11
Greeting Message (OGM):	10-minute microcassette (Variable, up to 30 seconds)
Incoming Message (ICM):	30-minute micro cassette selectable recording times (1 MIN/VOX)
Tape Deck:	Logic control dual micro cassette system
Ring Control:	2/4/TOLL SAVER
Power Output	350 mW max. across the monitor speaker
Monitor Speaker:	2″ PM dynamic (8 ohm)
Microphone:	Condenser microphone
Connection:	2 built-in modular jacks, DC-IN jack
Dimensions:	6 3/32″ × 1 31/32″ × 8 15/32″ [155 (W) × 50 (H) × 215 (D)] mm
Weight:	1 lb. 9.4 oz (720 g)

Design and specifications are subject to change without notice.

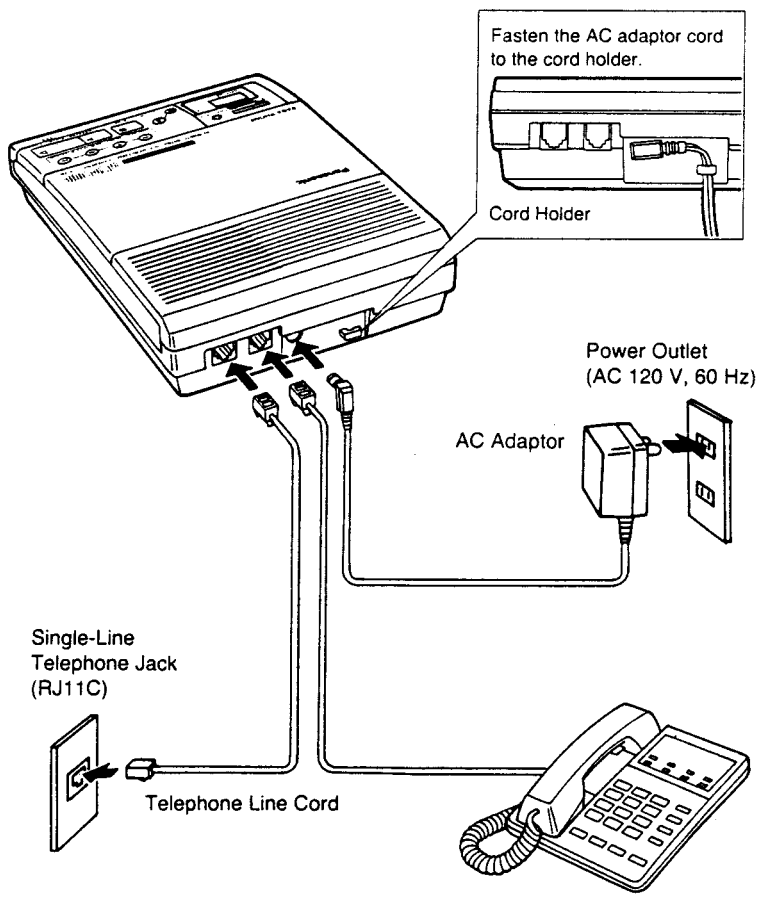
Panasonic

When referring to the serial number, supply all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

TABLE OF CONTENTS

	Page
Connection	2
Location of Controls	3
Disassembly Instructions	4
CPU Data	5, 6
Measurement and Adjustment Method	7
For Schematic Diagram	8
Terminal Guide of IC's, Transistors and Diodes	8
Schematic Diagram	9, 10
Printed Circuit Board	11~14
Cassette Deck Connection	15
Block Diagram	16
Circuit Operations	17~28
How To Replace Flat Package IC	29
Trouble Shooting Guide	30~36
Cassette Deck Parts Location	37
Cabinet and Electrical Parts Location	38
Extension Cable Connecting Method	39
Accessories and Packing Materials	39
Replacement Parts List	40~42
Operations	43, 44

CONNECTION



Note:
– USE ONLY Panasonic AC ADAPTOR KX-A11.
– AC adaptor must remain connected at all times.

Fig. 1

LOCATION OF CONTROLS

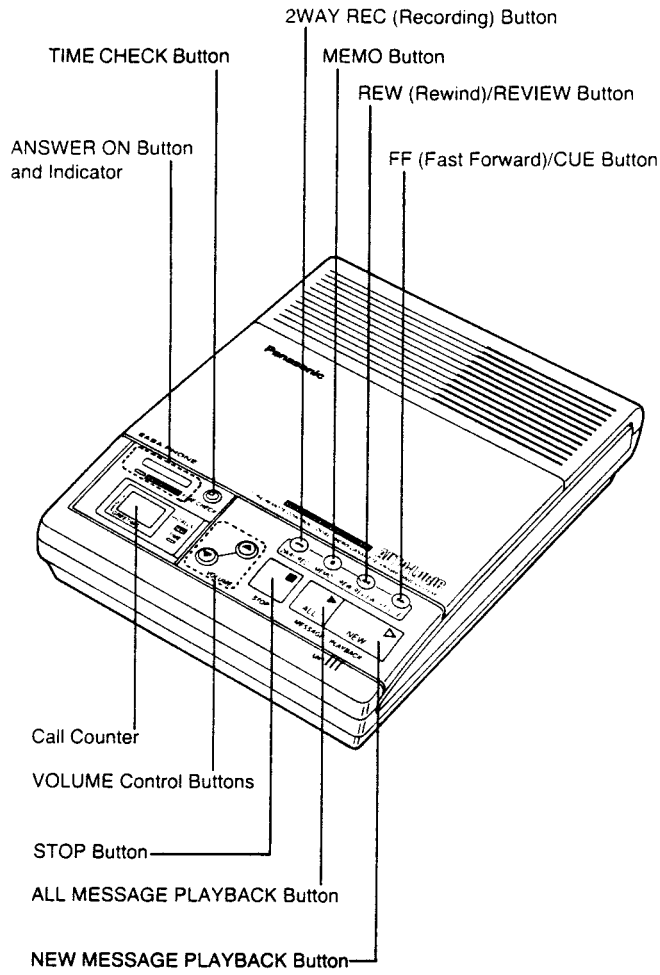


Fig. 2

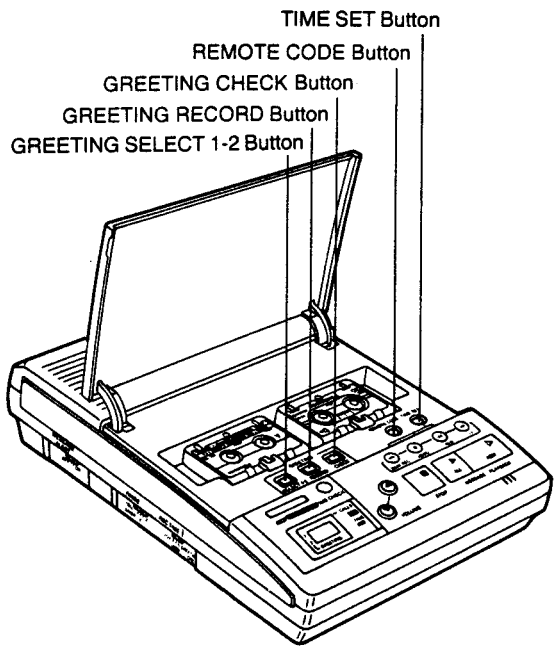


Fig. 3

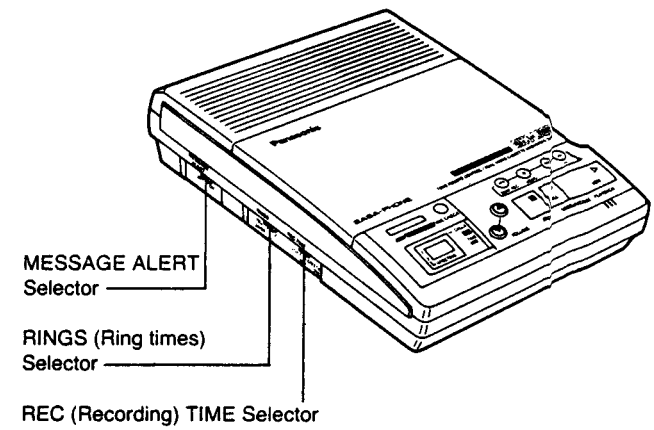


Fig. 4

DISASSEMBLY INSTRUCTIONS

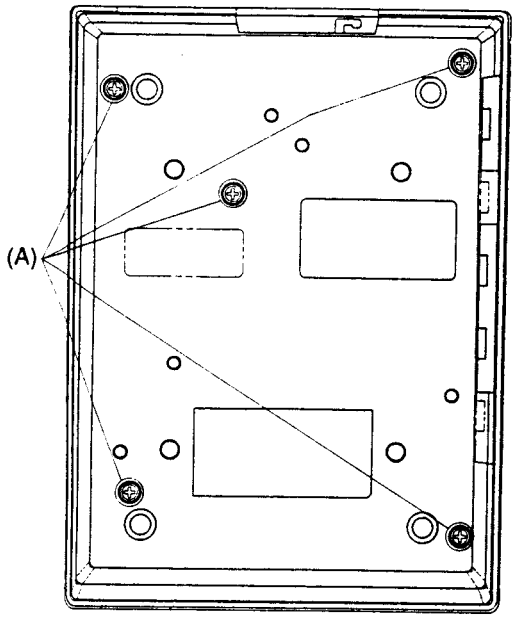


Fig. 5

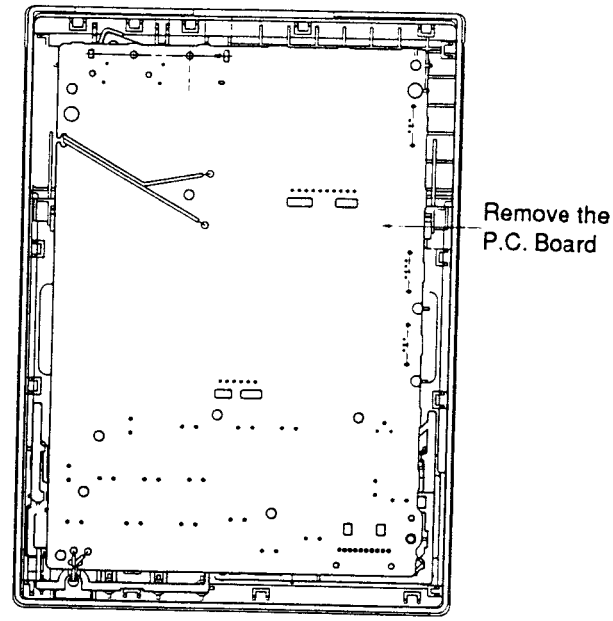


Fig. 6

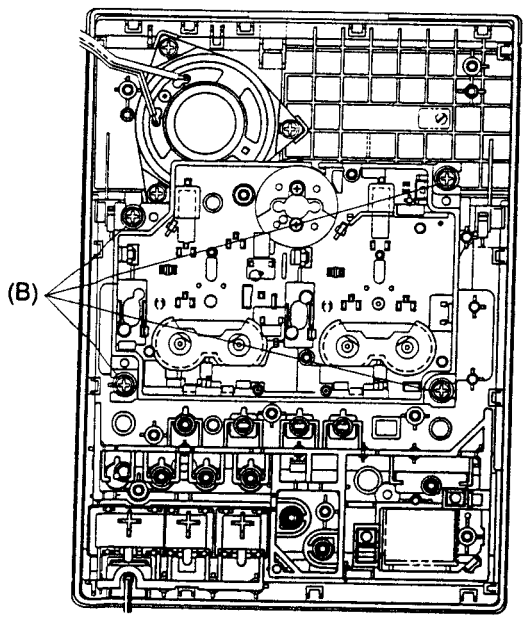


Fig. 7

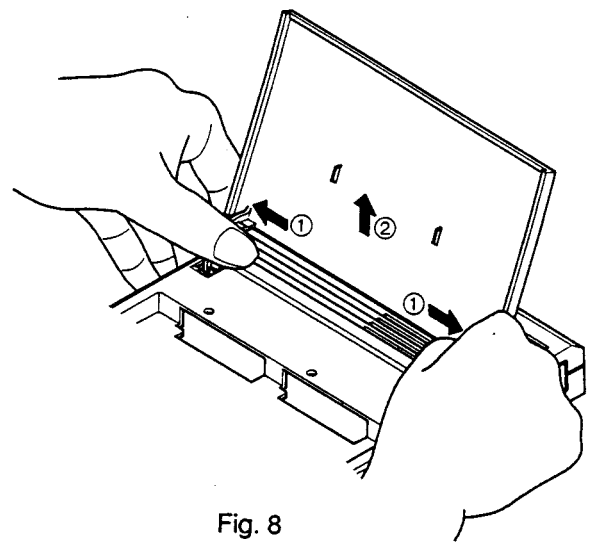
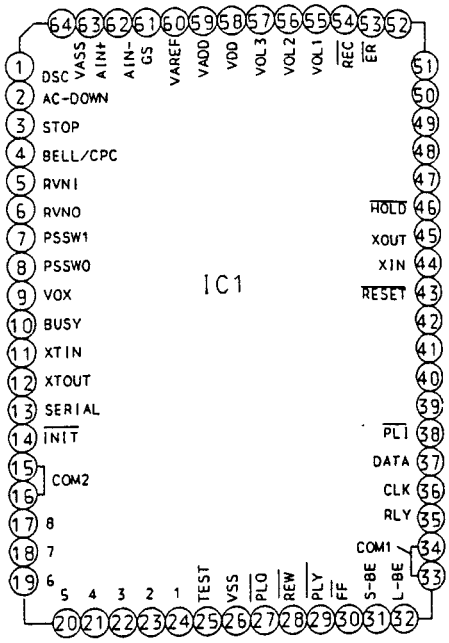


Fig. 8

Procedure	To remove—.	Remove—.	Shown in Fig.—.
1	Lower Cabinet	Screw (3x16) ..... (A)x5	5
2	Printed Circuit Board	Remove the P.C. Board.	6
3	Cassette Deck	Screw (3x10) ..... (B)x4	7
4	Cassette Lid	Remove the Cassette Lid.	8

CPU DATA



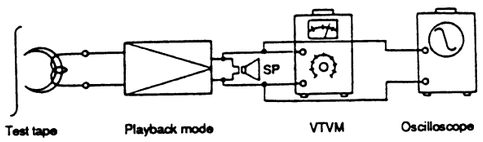
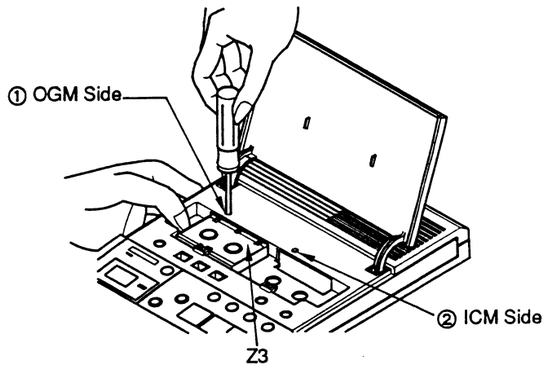
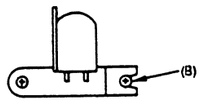
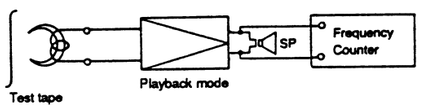
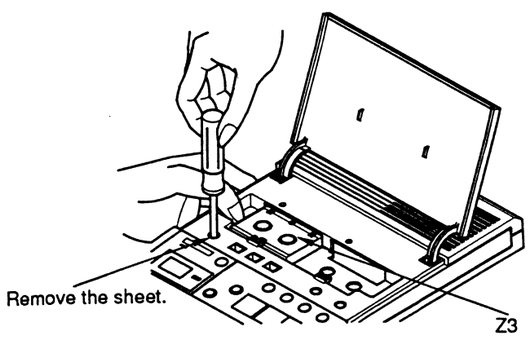
Part No.	PQVI850FK134
Power Supply:	5±0.5 V
Program ROM:	8K×8 bit
Inside Data RAM:	512×4 bit

Pin No.	Function	High	Low
1	DSC	Disconnect	
2	AC Down		AC Down
3	Stop		Standby
4	CPC Bell	CPC	Bell
5	RVN-ICM		
6	RVN-OGM		
7	Position Switch ICM		Head ON
8	Position Switch OGM		Head ON
9	VOX	Sound X	Sound O
10	Busy		
11	XT In		
12	XT Out		
13	Serial		
14	INIT		
15	COM 21		
16	COM 22		
17	Segment 8		
18	Segment 7		
19	Segment 6		
20	Segment 5		
21	Segment 4		
22	Segment 3		
23	Segment 2		

Pin No.	Function	High	Low
24	Segment 1		
25	Test		
26	Vss		
27	Plunger OGM		Plunger ON
28	Rewind Motor		Motor ON
29	Play Motor		Motor ON
30	FF Motor		Motor ON
31	Speaker Beep		
32	Line Beep		
33	COM 11		
34	COM 12		
35	TR		
36	C Clock		
37	C Data		
38	Plunger ICM		Plunger ON
39	Key Input		Key ON
40	Key Input		Key ON
41	Key Input		Key ON
42	Key Input		Key ON
43	Reset		
44	X In		
45	X Out		
46	Hold		
47	Key Input		Key ON
48	Key Input		Key ON
49	Storbe		Storbe
50	Storbe		Storbe
51	Storbe		Storbe
52	Storbe		Storbe
53	Not Used		
54	Rec Bias		Record Bias
55	Volume 1	Volume Up	
56	Volume 2	Volume Up	
57	Volume 3	Volume Up	
58	VDD		
59	VADD		
60	VAREF		
61	GS		
62	A IN-		
63	AIN+		
64	VASS		

MEASUREMENT AND ADJUSTMENT METHOD

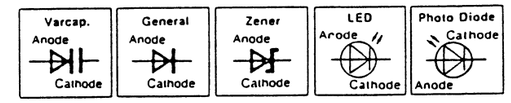
Notes: 1. Make sure the heads are clean.
2. Make sure the capstan and pressure roller are clean.
3. Room temperature for measuring and adjusting: 20±5°C (68±9°F)
4. Test equipments are not treated as replacement parts.

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
1. Head azimuth adjustment	1. Play back the test tape (QZZCWAT or PQZZLCT2401A) [Ref No. Z3]. 2. Adjust screw (B) shown in Fig. B for maximum output at SP terminal. (Test equipment connection is shown below.)  	* Record/playback head  Fig. B
2. Tape speed adjustment	1. Play back the test tape (QZZCWAT or PQZZLCT2401A) [Ref No. Z3]. 2. Adjust VR1 for 2980–3000 Hz on frequency counter reading.  	

■ FOR SCHEMATIC DIAGRAM

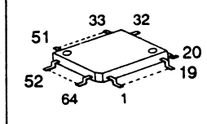
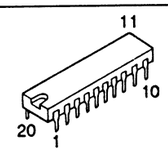
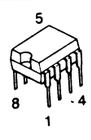
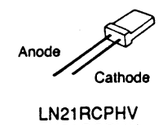
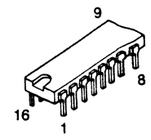
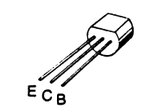
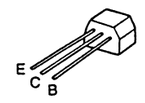
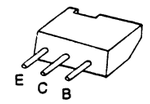
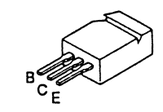
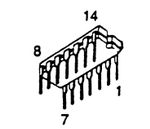
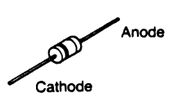
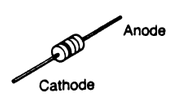
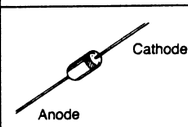
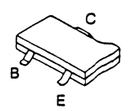
1. S1: Recording Time Selector.
2. S2: Ring Times Selector.
3. S3: Message Alert Selector.
4. S5: New Message Playback switch.
5. S6: All Message Playback switch.
6. S7: Stop switch.
7. S8: Volume Up switch.
8. S9: Volume Down switch.
9. S10: Answer On switch.
10. S11: Time Check switch.
11. S12: 2Way Recording switch.
12. S13: Memo switch.
13. S14: Rewind/Review switch.
14. S15: Fast Forward/Cue switch.
15. S16: Time Set Selector.
16. S17: Remote Code switch.
17. S19: Greeting Check switch.
18. S20: Greeting Record switch.
19. S21: Greeting Selector switch.

Important safety notice
The shaded areas on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

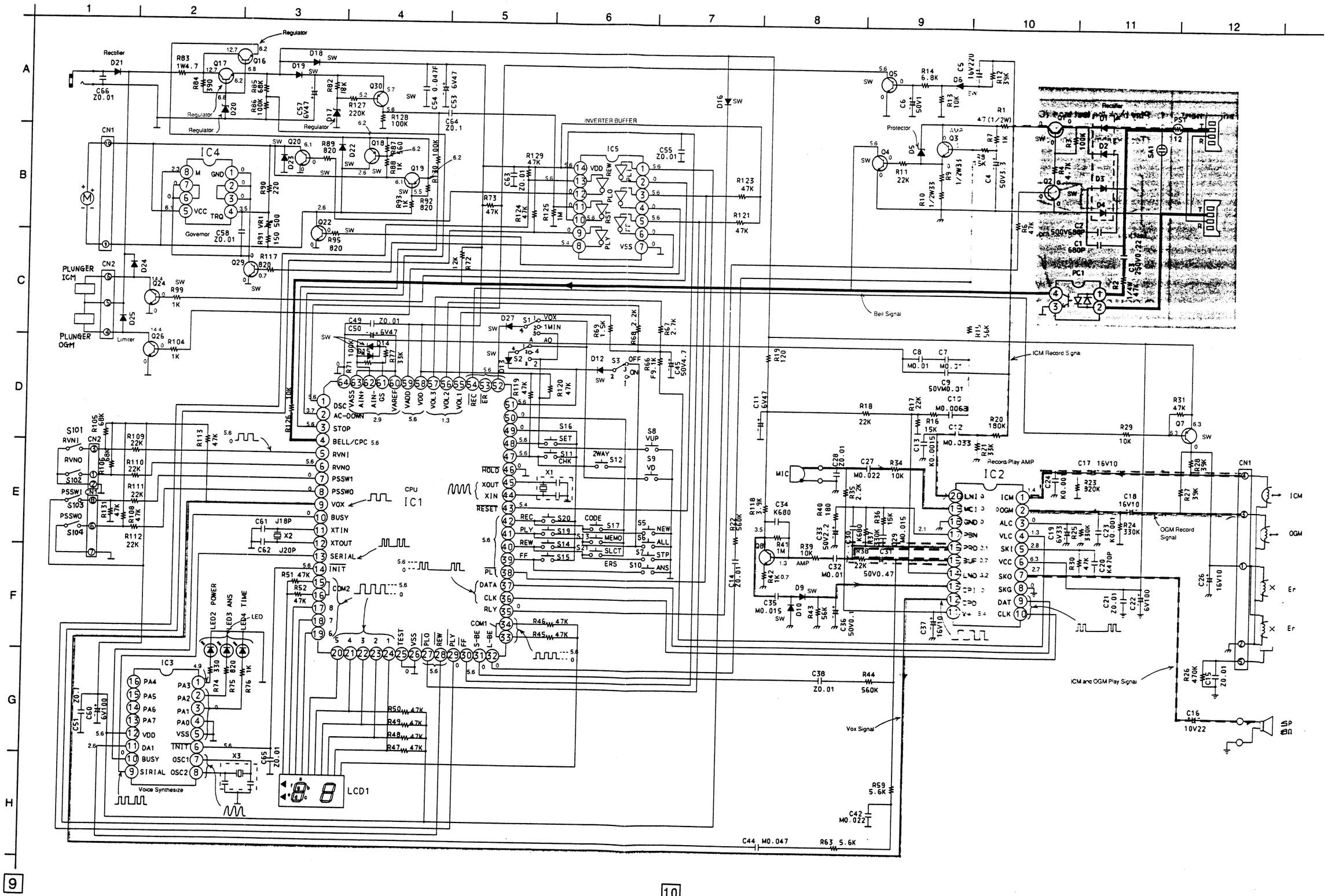


- DC voltage measurements are taken with electronic voltmeter from negative voltage line.
- "ANS SET" Standby position.
- This schematic diagram may be modified at any time with the development of new technology.

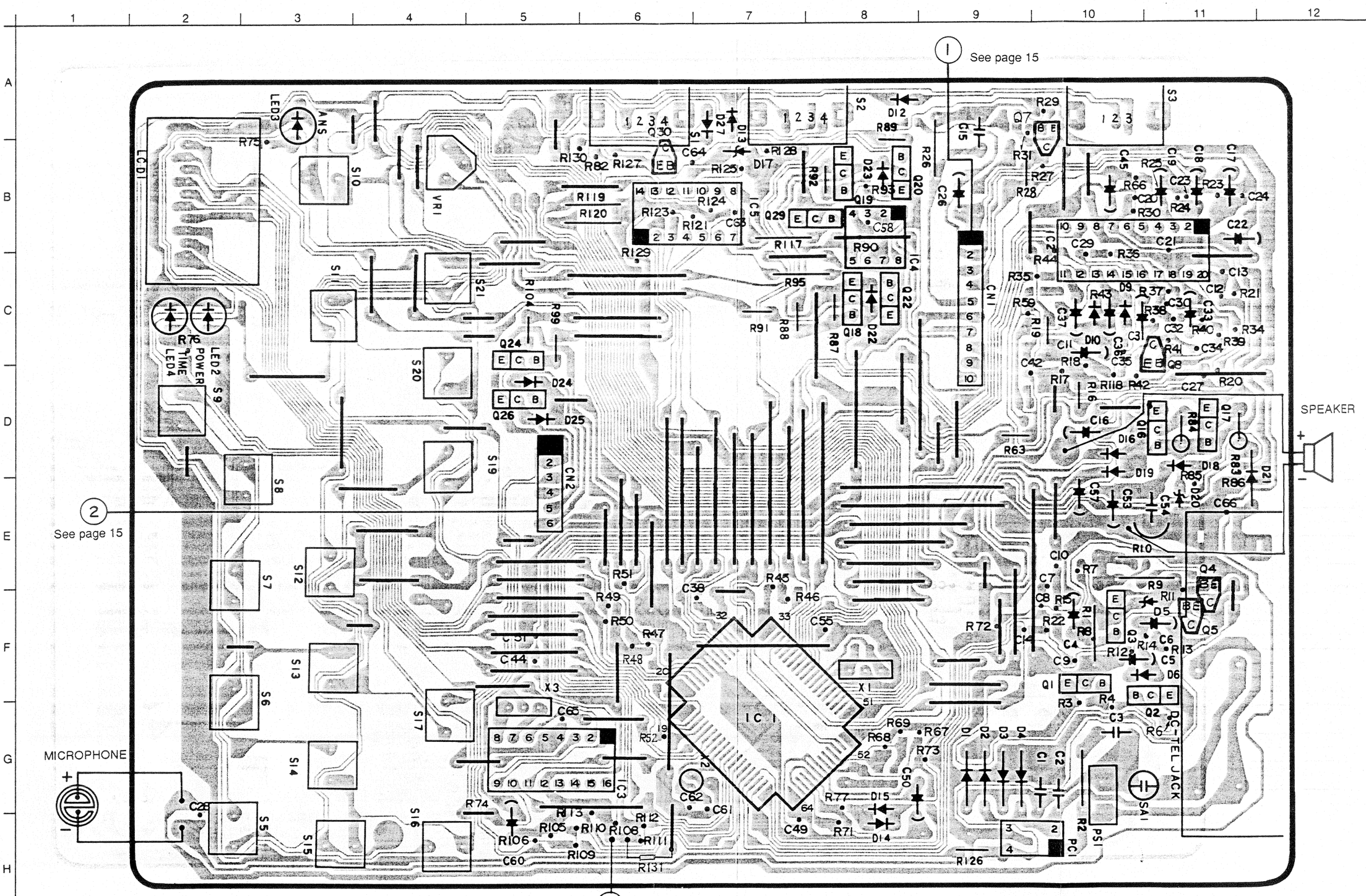
TERMINAL GUIDE OF ICs, TRANSISTORS AND DIODES

 PQVI850FK134	 PQVISC79100P	 PQVIBA6220	 LN21RCPHV LN31GCPHU	 PQVICS1008ON
 2SA1625 PQVTKSD261CY	 2SA854 2SC1741S	 2SD662B	 2SD2136 2SD2137	 PQVITC7H04P
 PQVDS5688G	 MA4180	 MA4033	 PQVDMTZ6R8 1SS131 1SS119	 2SB1218A 2SD1819A

SCHEMATIC DIAGRAM



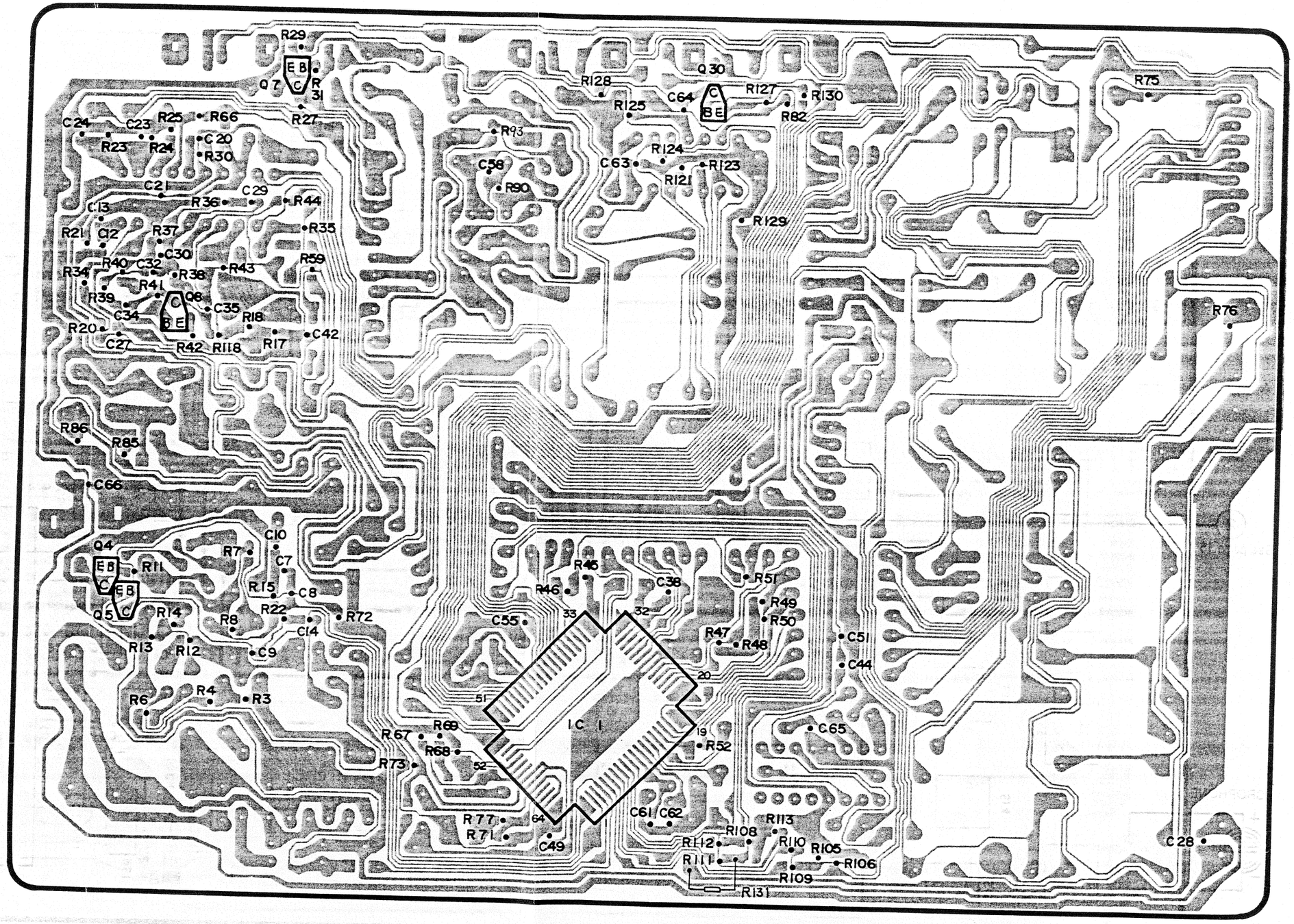
PRINTED CIRCUIT BOARD (COMPONENT VIEW)



Note: This circuit board may be modified at any time with the development of new technology.

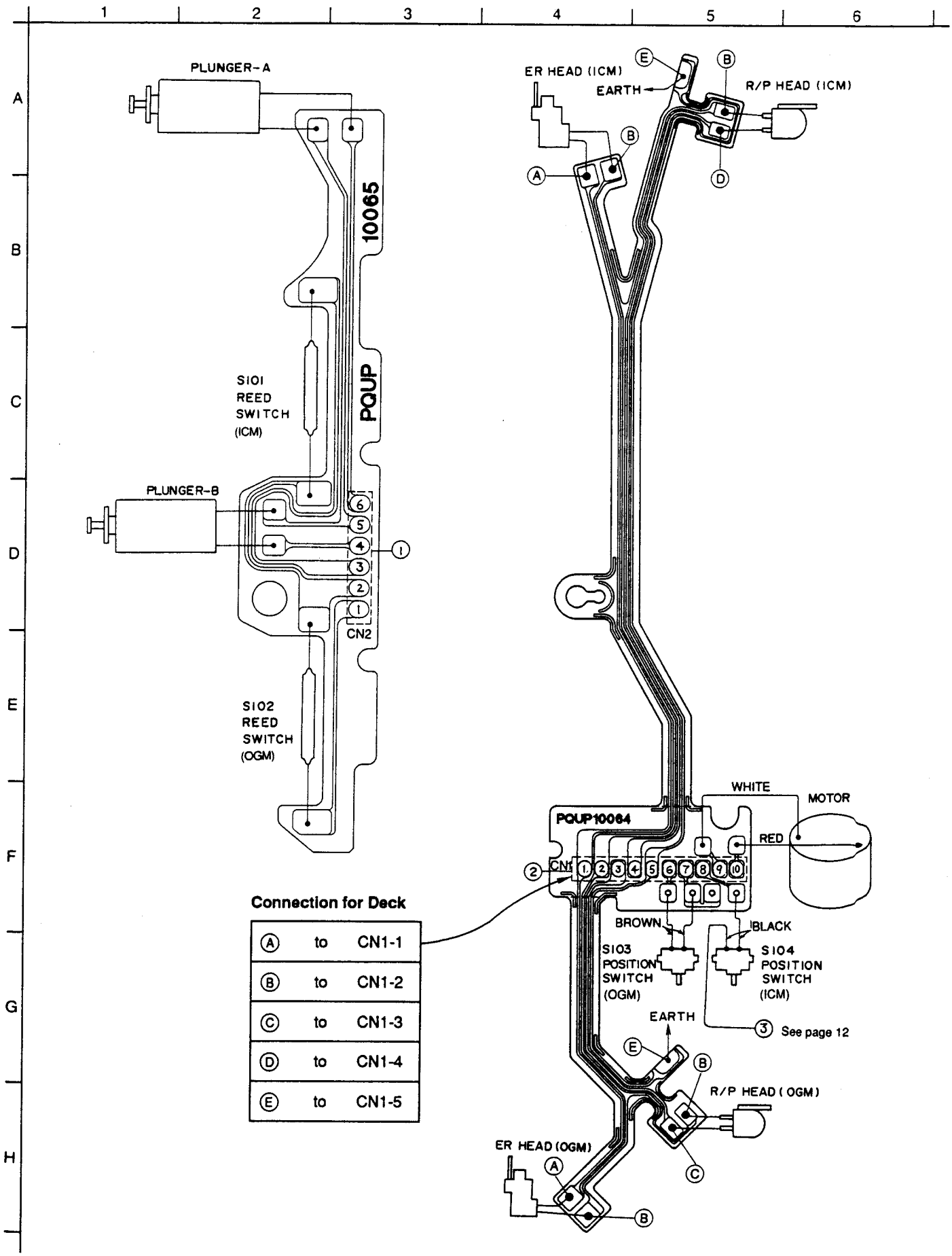
PRINTED CIRCUIT BOARD (BOTTOM VIEW)

IC1	
Pin No.	Voltage
1	5.6
2	3.7
3	5.6
4	5.6
5	5.6 / 0
6	5.6
7	0
8	0
9	
10	0
11	
12	
13	
14	5.6
15~24	5.6 / 0
25	0
26	0
27	5.6
28	5.6
29	0
30	5.6
31	0
32	0
33	5.6
34	0
35	0
36	5.6
37	0
38~43	5.6
44	
45	
46	0
47	5.6
48	5.6
49	0
50	0
51~54	5.6
55	1.3
56	1.3
57	1.3
58	5.6
59	5.6
60~63	2.9
64	0



Note: This circuit board may be modified at any time with the development of new technology.

CASSETTE DECK CONNECTION



Connection for Deck

Ⓐ	to	CN1-1
Ⓑ	to	CN1-2
Ⓒ	to	CN1-3
Ⓓ	to	CN1-4
Ⓔ	to	CN1-5

BLOCK DIAGRAM

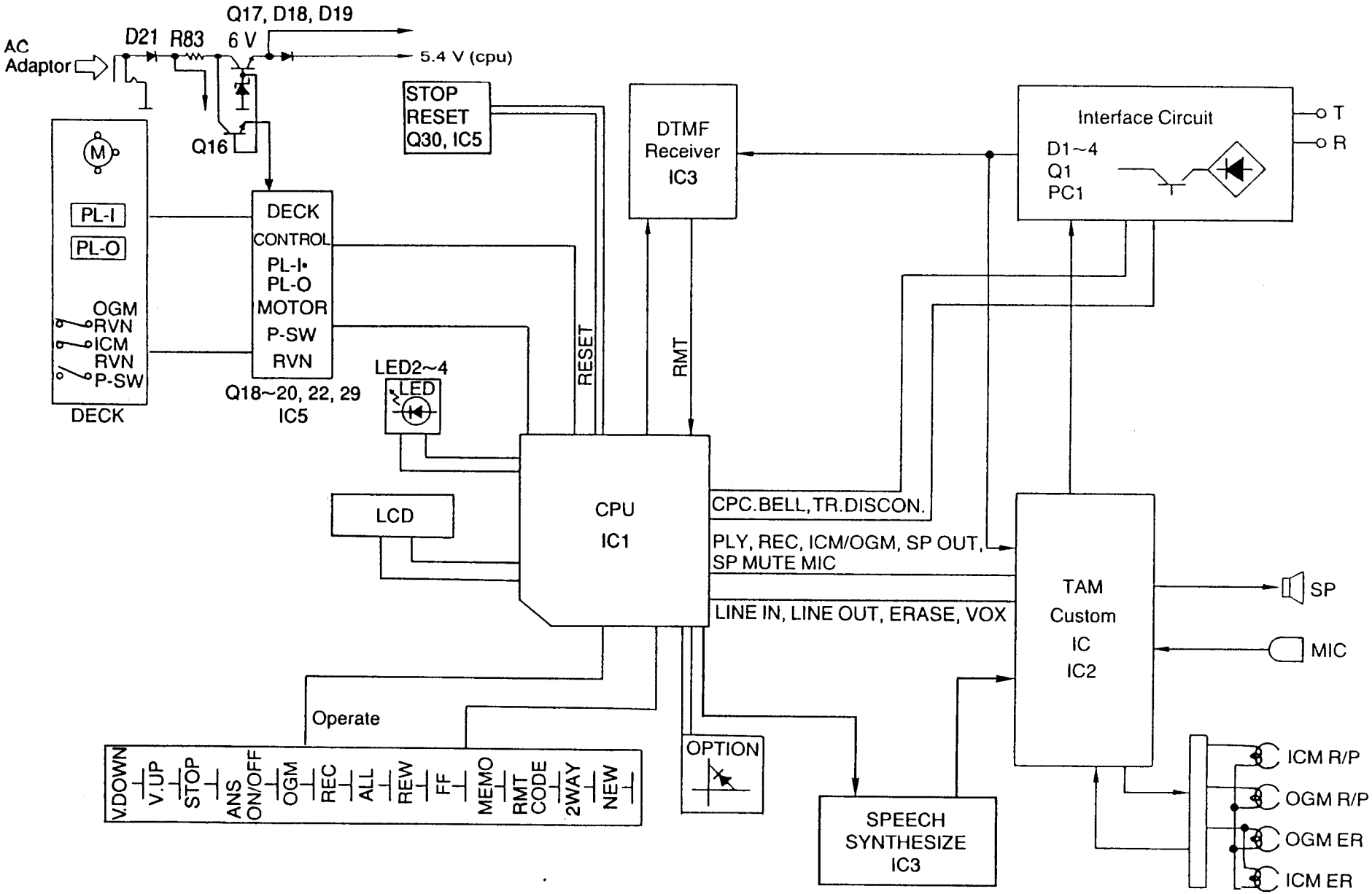


Fig. 9

CIRCUIT OPERATIONS

Note:
The circuit diagram may be modified at any time with the development of new technology.

■ INTERFACE

Circuit Operation:

•OFF-HOOK CONDITION

In the idle mode, IC1 pin 35 when LOW is cuts the DC current and decreases the ring load. When a ring voltage appears at the Tip (T) and Ring (R) leads (when the telephone rings), the AC ring voltage is transferred as follows: T→PS1→C3→R2→PC1→R to close the telephone line loop and PC1→IC1 pin 4 for processing through the unit. Once the CPU detects the ring signal, thus providing an off-hook condition (active DC current flows through the circuit Q1 and Q2 turn on), the following signal flows is for the voice signal.
T→PS1→D1→Q1→R1→Q3→R9→R10→D4→R.

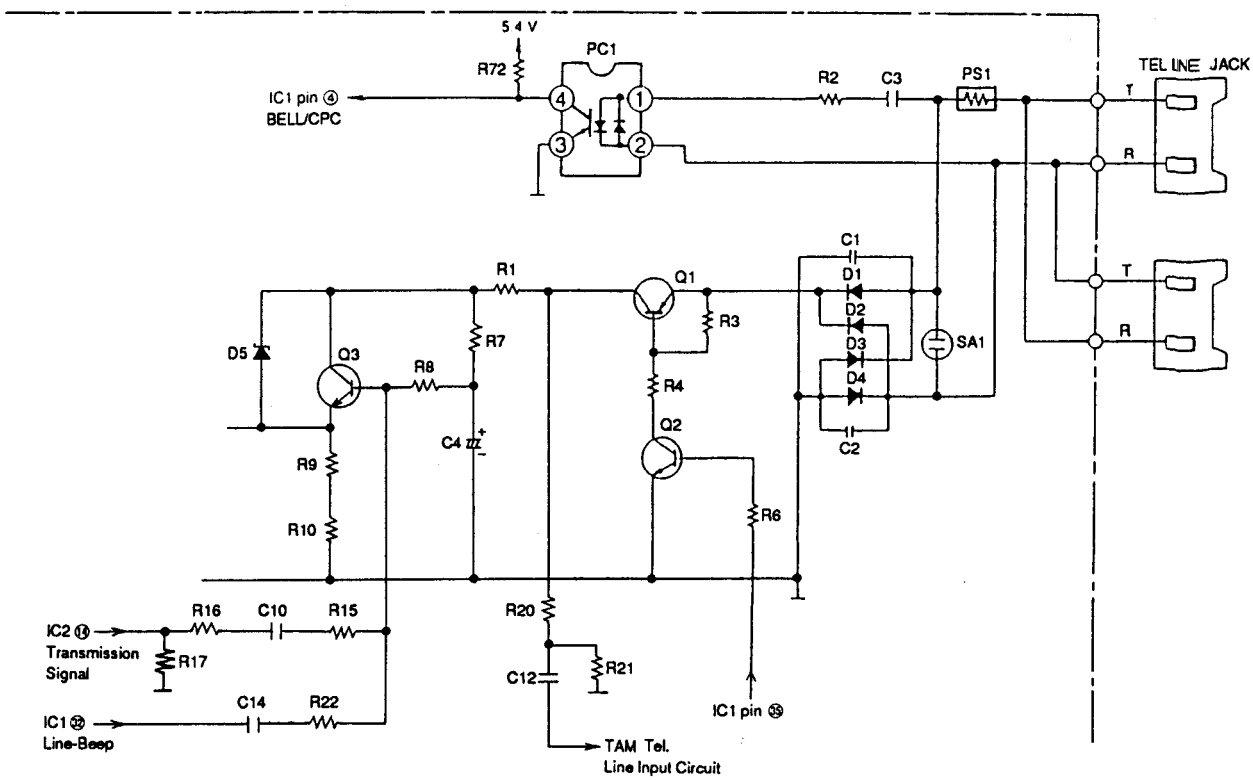
•ON-HOOK CONDITION

When IC1 pin 4 becomes "L", Q2 and Q1 turn OFF, hence Q1 is connected to cut the DC current and the voice signal. The unit is consequently in on-hook condition.

•SPECIFICATIONS

In the on-hook state (idle), the current flows between the telephone line and the unit as follows:
T→PS1→C3→R2→PC1→R.
The DC component is blocked by C1: thereby providing the on-hook condition.
The AC interface impedance is over 100 kΩ; thus satisfying the telephone company requirements.
SA1 provide surge protection.

Circuit Diagram

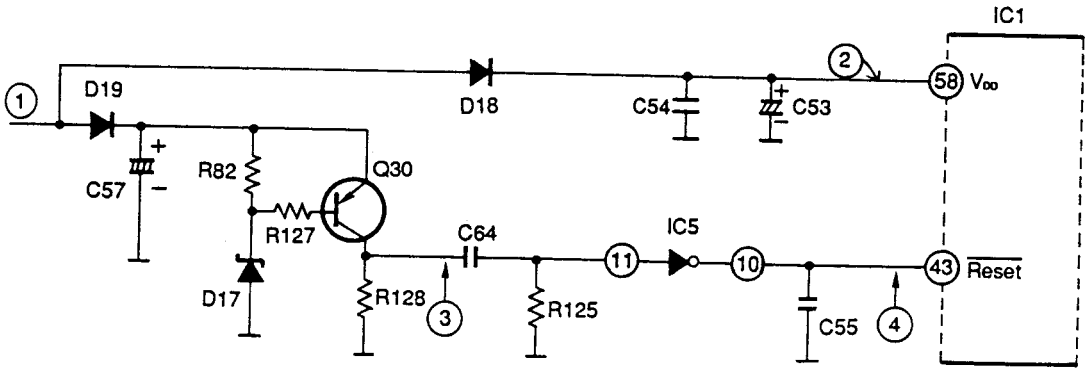


■ INITIALIZING CIRCUIT

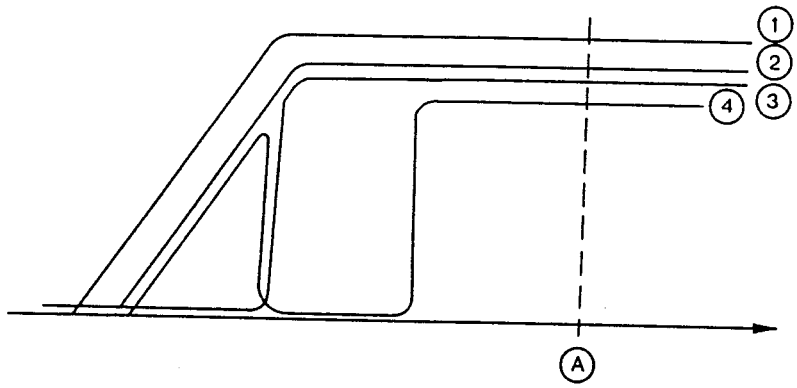
Function:
This circuit is used for to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:
When the AC Adaptor is inserted into the unit, then the voltage is shifted by D18 and power is supplied to the CPU.
The set can operate beyond point (A) in the circuit voltage diagram.

Circuit Diagram



Circuit Voltage

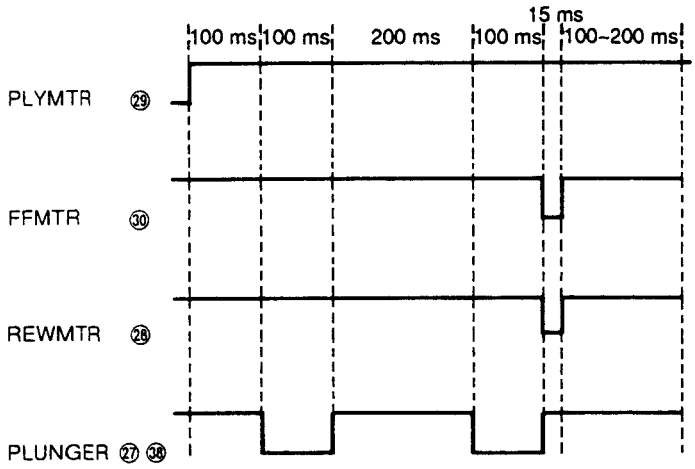


■ TAPE TRANSPORT CONTROL

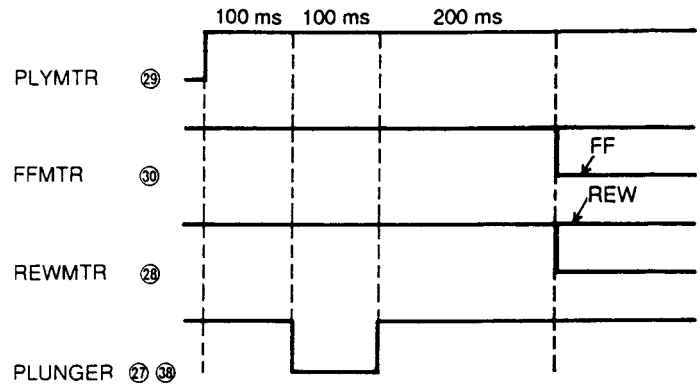
Circuit Operation:
The timing for the plunger and motor which are used to operate the deck is as shown in the timing chart

Timing Chart

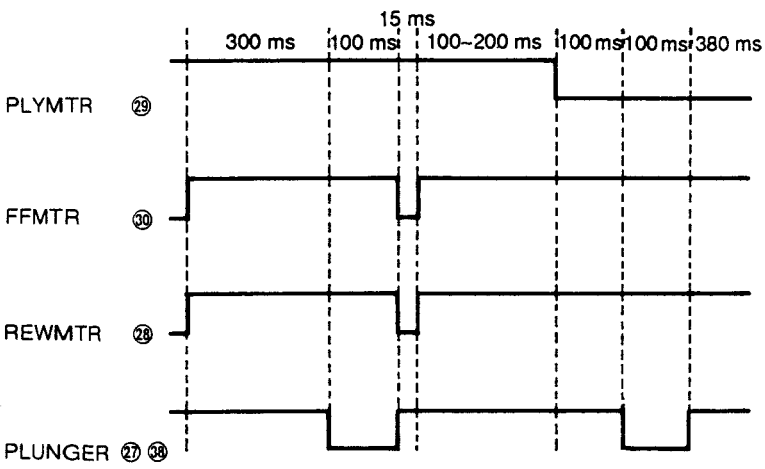
PLAY/REC→STOP



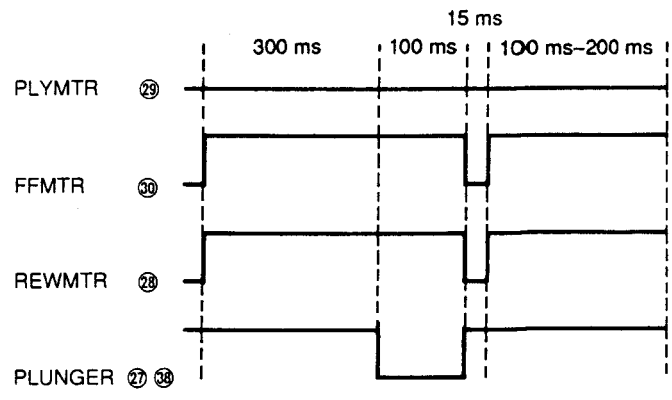
PLAY/REC→FF/REW



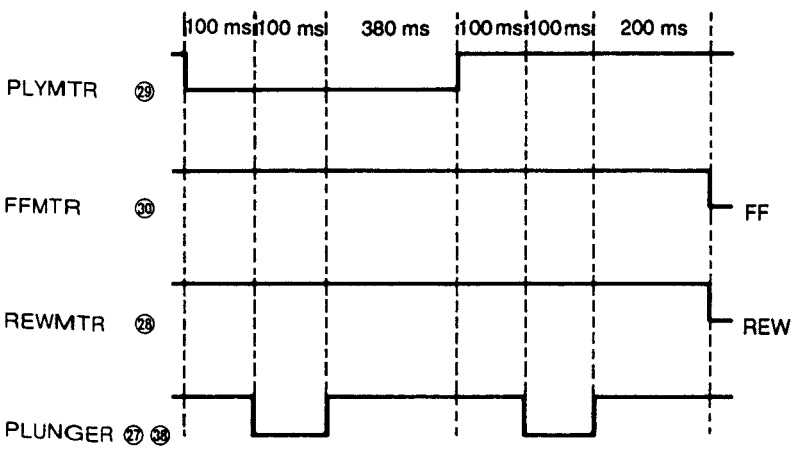
FF/REW→PLAY/REC



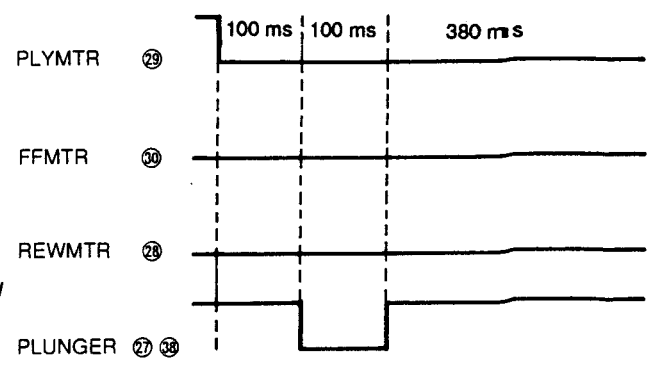
FF/REW→STOP



STOP→FF/REW



STOP→PLAY/REC



■ PLAYBACK CIRCUIT (OGM, ICM MESSAGE)

Circuit Operation:
The playback signal for OGM and ICM MESSAGE is selected by IC2.

- ICM
  ICM R/P→C17→pin 1 of IC2
- OGM
  OGM R/P→C18→pin 2 of IC2

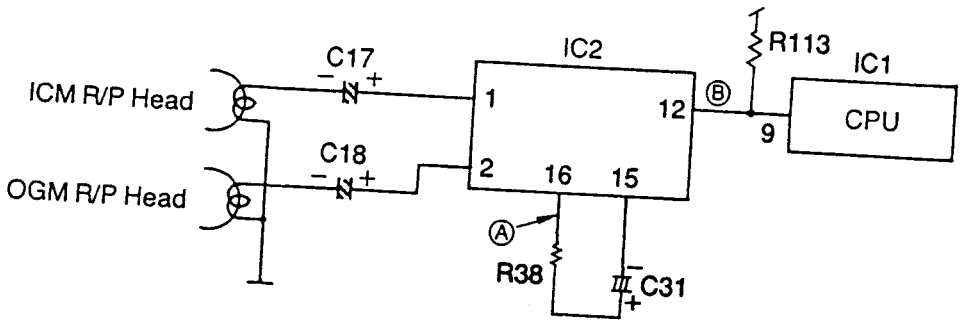
→ pin 16 of IC2→C31→R38→pin 15 of IC2→pin 7 of IC2→C16→SPEAKER.

Circuit Diagram ..... See page 22

■ OGM END DETECTOR CIRCUIT

Circuit Operation:
When the Stop Button is pressed upon completion of the OGM recording, no sound signals are recorded on the tape.
A no-sound detection system is used during play back. If a no-sound condition exists for 5 seconds, CPU detects the OGM end by the output of Vox Circuit (Fig. C).

Circuit Diagram



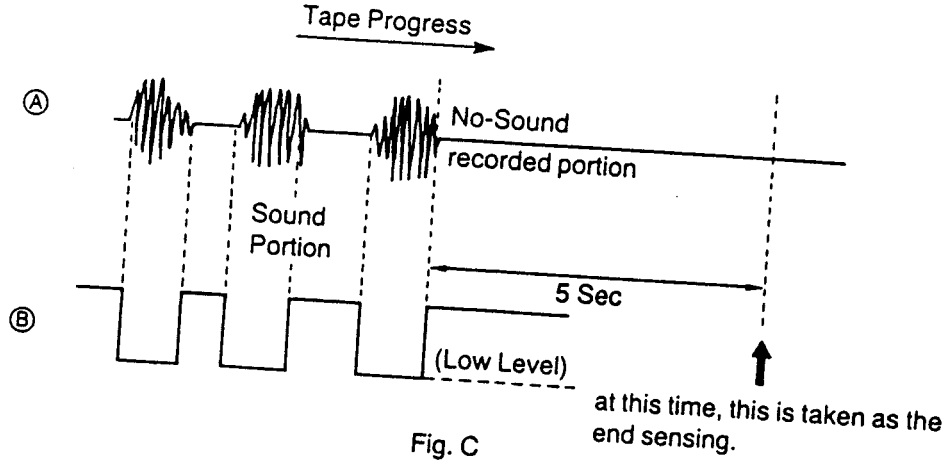


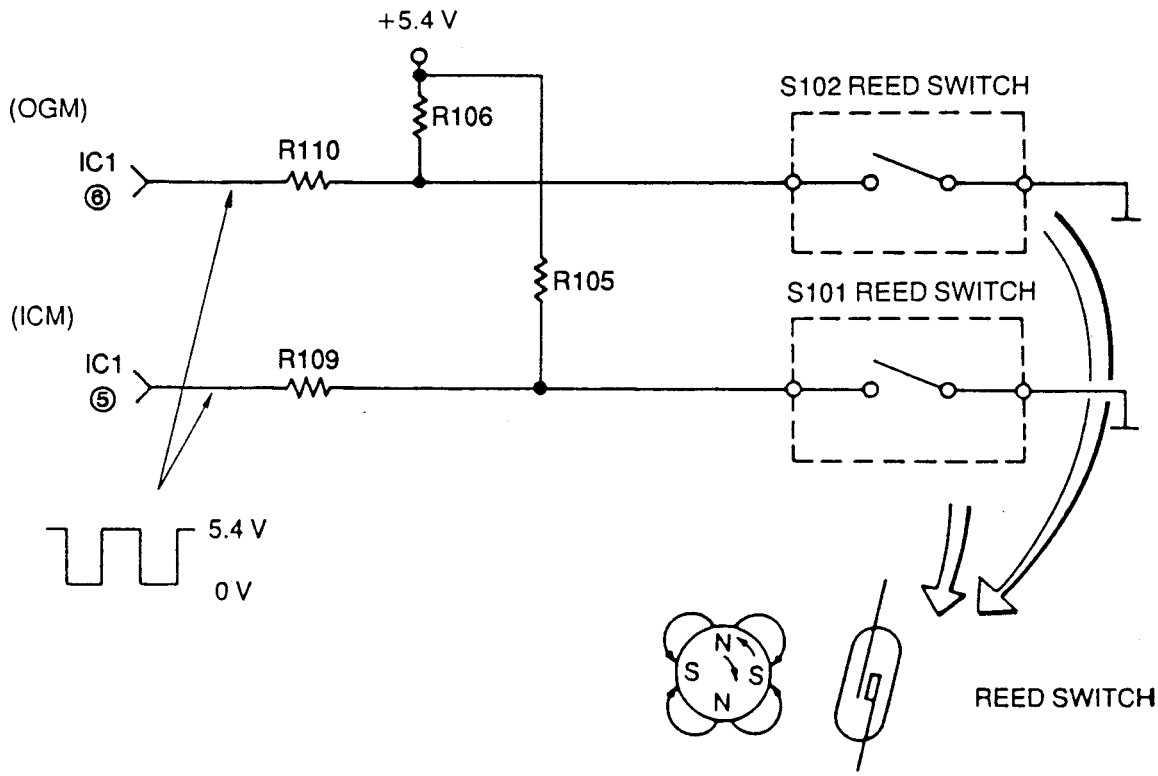
Fig. C

■ ICM AND OGM TAPE ROTATION DETECTOR CIRCUIT

Circuit Operation:
When there are changes in the direction of the magnetic field caused by the rotation of the four-pole ferrite magnet, they are detected by the Reed Switch. This output is added to the microcomputer input.

Reed Switch (S101)→R109→IC1 ⑤ (ICM)
Reed Switch (S102)→R110→IC1 ⑥ (OGM)

Circuit Diagram



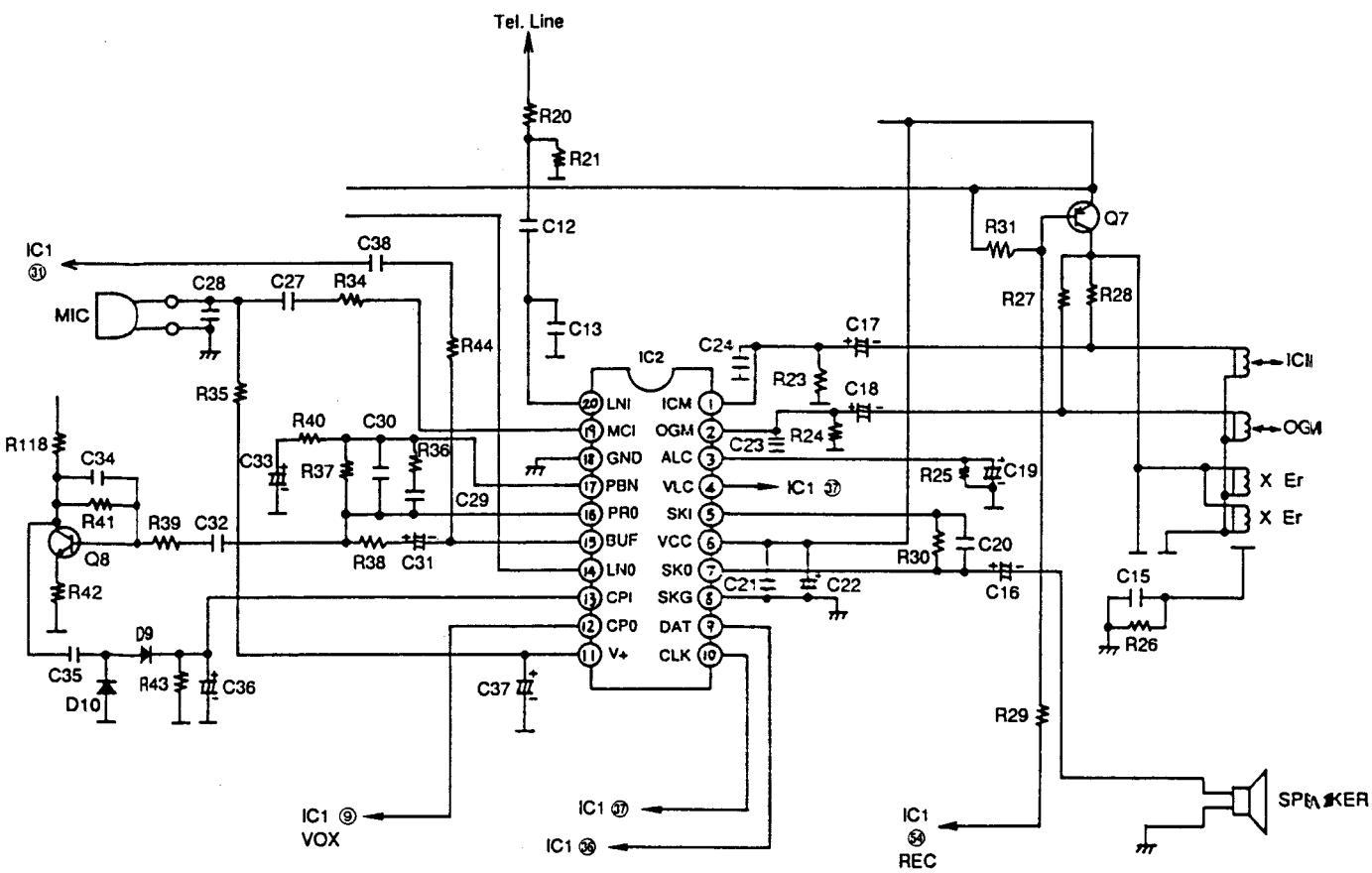
■ RECORD CIRCUIT

Circuit Operation:
(Recording signals)
Recording signal from the telephone line or MIC is selected by IC2.
The recording signal flows as follows:
Mic→C27, R34→IC2 pin 19→IC2 pin 16→R38→C31→IC2 pin 15→IC2 pin 1→C17→ICM Head
Tel line→R20, C12→IC2 pin 20 →IC2 pin 2→C18→OGM Head

(Signal)
The beep tone is generated by IC1.
The beep tone of the ICM recording (from pin 31 of IC1) is processed in the ICM recording head via C38 and R44.

(Erase)
When in the Rec mode, pin 54 of IC1 is Low.
The voltage is applied to the Erase Head, thus the Erase Head is activated.
The bias current is applied to the R/P Head via Q7, R27 and R28.
The DC current flow is as follows;
6 V DC→Q7 turns ON (by Low level of IC1 pin 54)→Q7 emitter→Q7 collector→Erase Head.

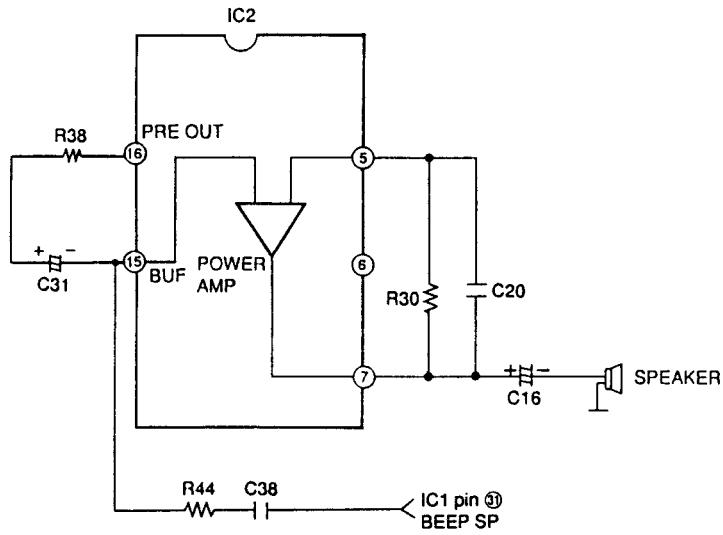
Circuit Diagram



■ MONITOR CIRCUIT AND SPEAKER MUTE CIRCUIT

Circuit Operation:
The monitor signal flow is as follows:
The Line signal and Head signal are amplified by IC2 in each mode. Then these signals appear at pin 7 of IC2.
Pin 16 of IC2→R38→C31→pin 15 of IC2→pin 7 of IC2→C16→SPEAKER.
The speaker beep tone path: Pin 31 of IC1→C38→R44→pin 15 of IC2→pin 7 of IC2→C16→Speaker.

Circuit Diagram

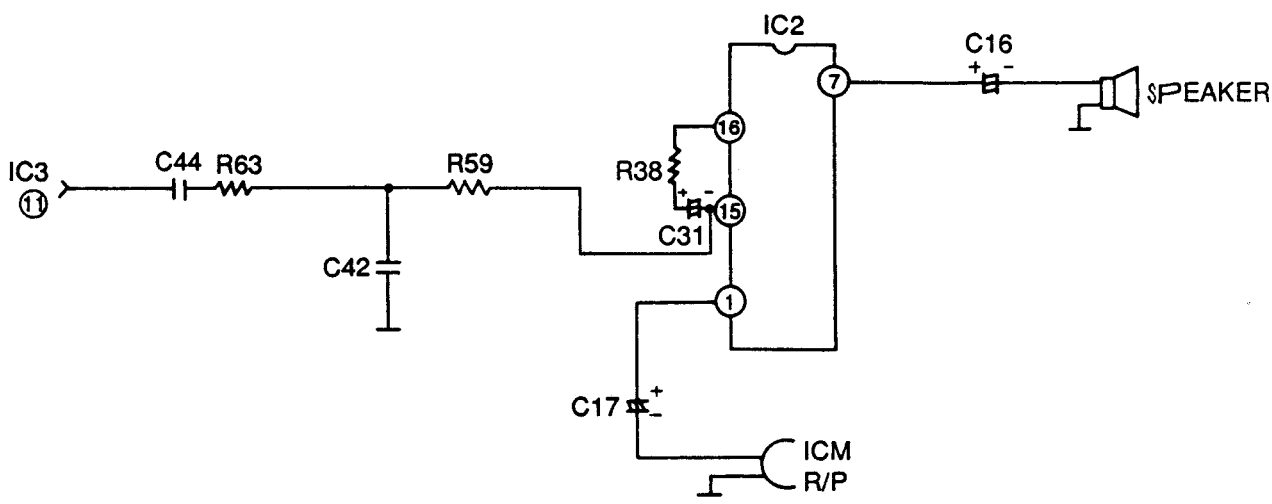


■ SPEECH SYNTHESIS SIGNAL CIRCUIT

• **Audio speaker monitor source:**
In the circuit diagram, the audio signal from pin 64 of IC4 takes the following path to the monitoring speaker.
Pin 11 of IC3→C44→R63→R59→pin 15 of IC2→pin 7 of IC2→C16→Speaker.

• **Audio record signal source**
Pin 11 of IC3→C44→R63→R59→pin 15 of IC2→pin 1 of IC2→C17→ICM Head.

Circuit Diagram



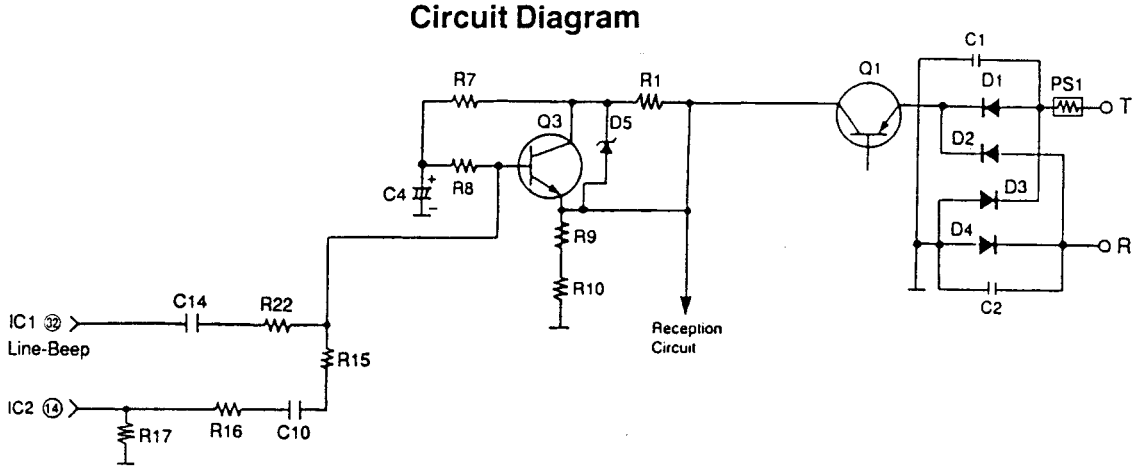
■ LINE OUTPUT CIRCUIT

Each of the signals is sent to the telephone line as follows.

•(Beep Tone)→IC1 pin 32→C14→R22→Q3 base→Q3 collector→R1→Q1→D1~D4→PS1→Telephone line

•(Tape Playback Sianal) IC2 pin 14→R16→C10→R15

Circuit Diagram



■ RING DETECTOR CIRCUIT

Function:

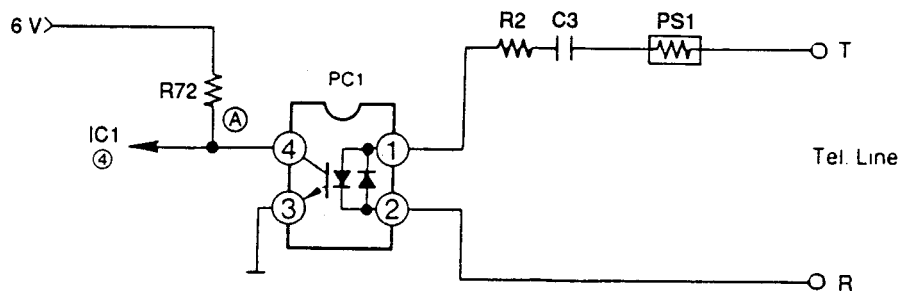
This circuit activates the CPU to respond to the ring signal from the telephone line during the ANSWER mode of operation.

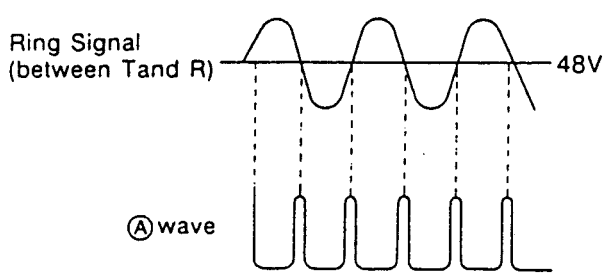
Circuit Operation:

This ring signal flows through T→PS1→C3→R2→PC1 pin 1→PC1 pin 2→R, hence photocoupler PC1 pin 4-3 willturn ON.

As a result, IC1 pin 4 goes Low, indicating that Ring Signal was inputted.

Circuit Diagram



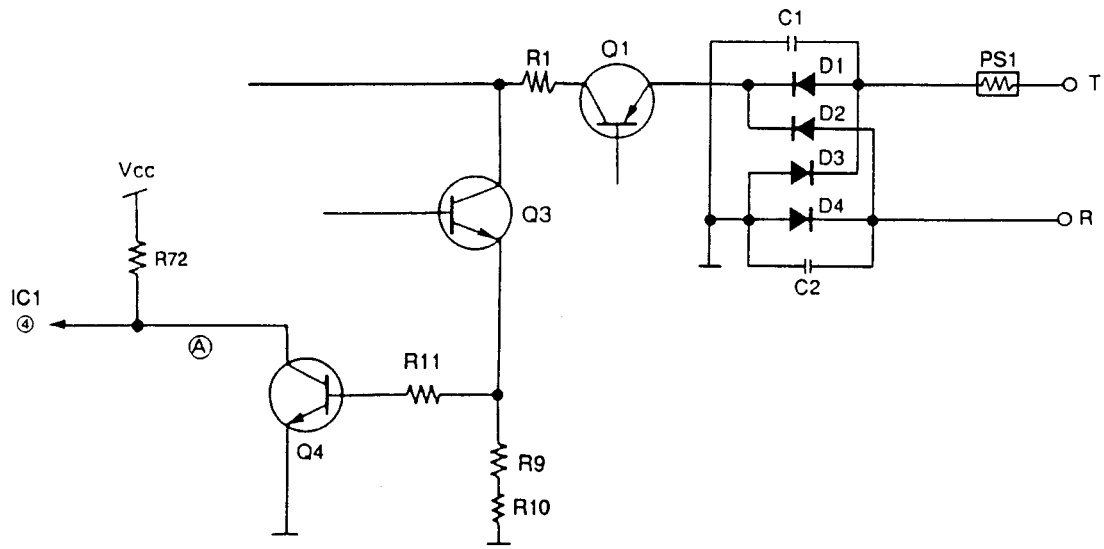


■ CPC (CALLING PARTY CONTROL) DETECTOR CIRCUIT

Function:
The CPU DETECTOR complements the unit's shut off, in the ANSWER mode, after the caller hangs up. At this time, the CPU DETECTOR takes over.
The CPC DETECTOR senses the temporary disconnection of the telephone line which occurs after the caller hangs up.

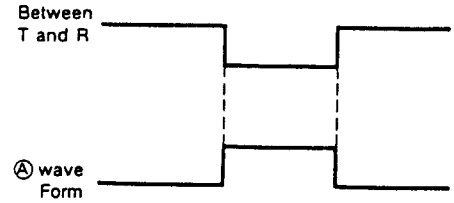
Circuit Operation:
When the unit seizes a line, current will flow through D1~D4, PS1, Q3, R10 and R9. As a result, current will flow to the base of Q4 via R11, causing Q4 to turn ON. As a result, IC1 pin 4 will go LOW. If then the line is momentarily cut, line current will cease to flow, and Q4 will turn OFF. Consequently IC1 pin 4 will go High, hence this condition will be detected.

Circuit Diagram



CPC Select

	A	B
OK	more than 8 ms	more than 600 ms
NG	less than 5 ms	less than 350 ms

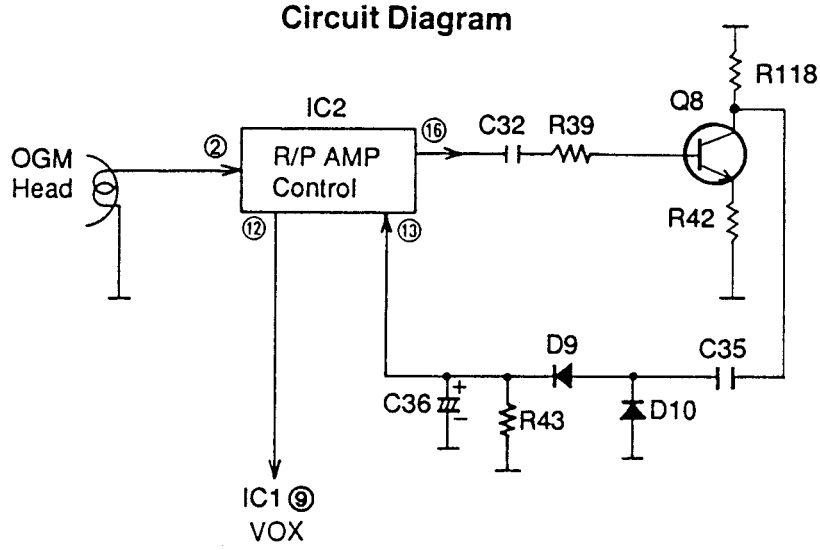


■ VOX CIRCUIT

Function:
The VOX circuit is designed to detect cyclic signals in which the signal is ON for 100 msec. to 1 sec, continuous sounds and no sound at all.
After detection, the CPU issues an instruction that makes VOX operation possible.
This means that when a telephone call has ended, the phone is reset and is ready to receive the next call.

Circuit Operation:
A signal output from terminal pin 16 of IC2 passed through C32, R39 and inputted to 13 of IC2→pin 12 of IC2→pin 9 of IC1.
When sound is present, the output at pin 12 of IC2 becomes a low level, while no-sound its output becomes a high level.

Circuit Diagram

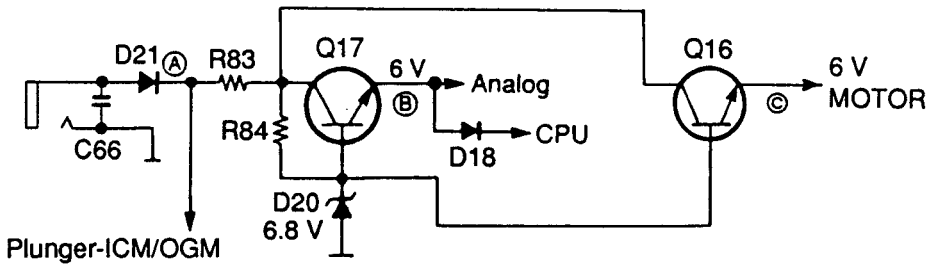


■ POWER SUPPLY CIRCUIT

Function:
Power from the AC adapter passes through the 1-stage regulating block consisting of Q16, Q17 and provides system voltages of 6 V.

Circuit Operation:
Power from the AC adapter is supplied directly to the plunger (Ⓐ). Q17 is the first stage regulated power supply. The voltage at point Ⓑ is regulated to 6 V by the 6.8 V zener voltage of D20. The 6 V voltage is shifted by D18 to 5.4 V which is used to power the CPU, etc.
Q16 is the first stage regulator power supply. The voltage at point © is regulator to 6 V by the 6.8 V zener voltage of D20. The 6 V voltage to Motor Drive circuit etc.

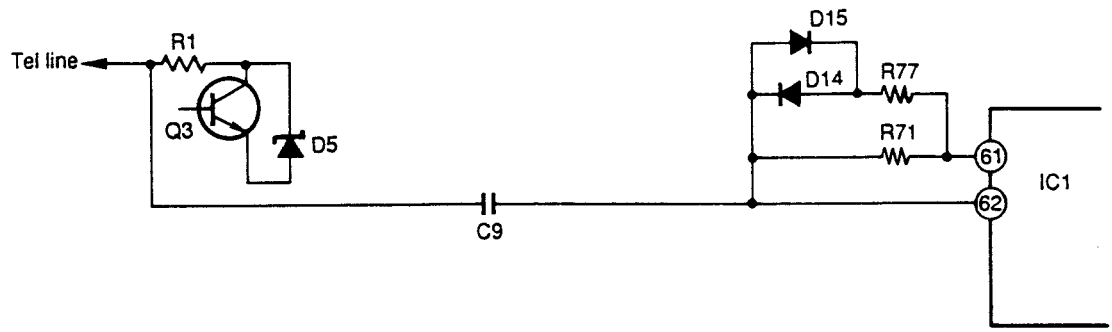
Circuit Diagram



■ REMOTE SIGNAL DETECTOR CIRCUIT

Circuit Operation:
A remote control signal is used with the dual-tone multiple-frequency (DTMF) signal.
The remote signal input from Tel line→C9→pin 62 of IC1, and is inputted to pin 62 of IC1.

Circuit Diagram

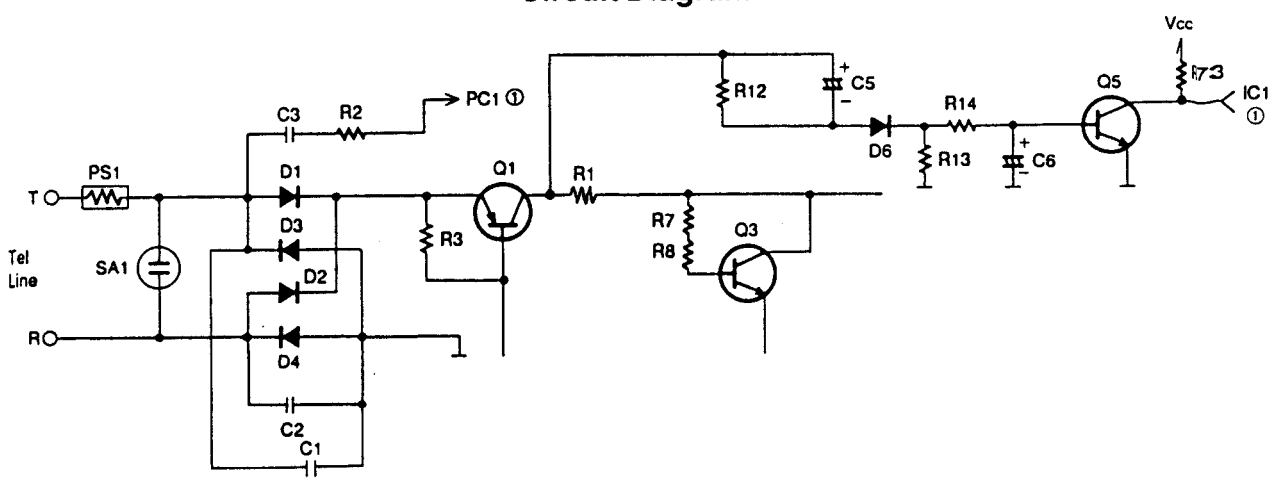


■ AUTO DISCONNECT CIRCUIT

Function:
This circuit is used to detect the fact that another telephone connected to the same line is OFF-HOOK while the unit is in a receiving status or OGM transmitting status.

Circuit Operation:
T→PS1→D1→Q1→C5→D6→R14→Q5. During this interval C5 charges and the base of Q5 becomes High, causing Q5 to go ON.
If a parallel-connected telephone is put into an OFF HOOK status, charge ceases to flow to C5, and the base of Q5 becomes Low, causing Q5 to go OFF.
However, the system is designed so that if the voltage fluctuation is small, the charging and discharging of C6 has no effect on the system.
When a line is connected, Q5 goes On, causing pin 1 of IC1 to go low. When the line is disconnected, Q5 goes off, causing pin 1 of IC1 to go high.

Circuit Diagram



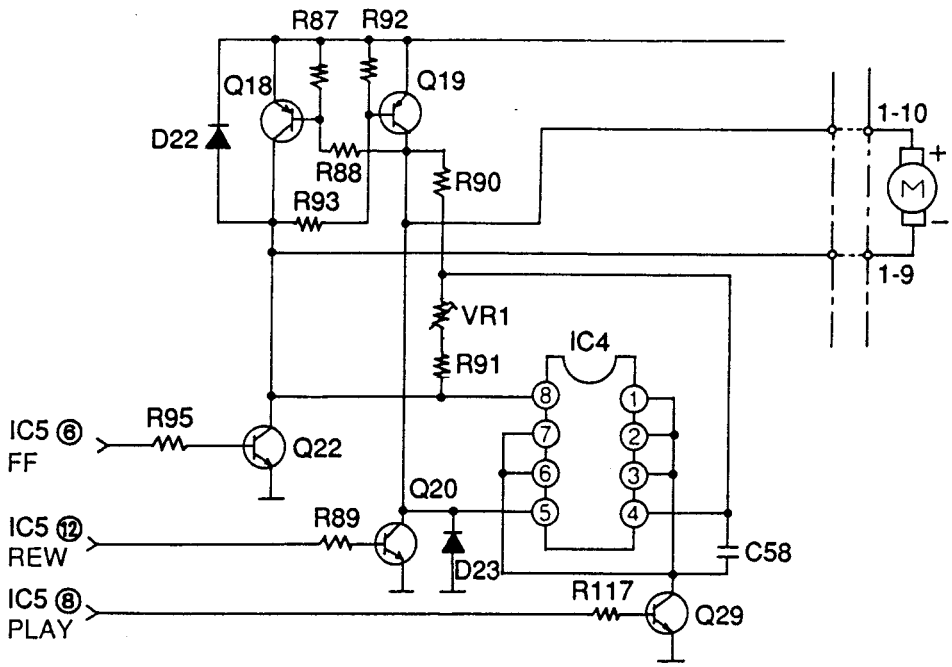
■ MOTOR DRIVE CIRCUIT

Playback (or Recording)
When pin 8 of IC5 becomes "H" and Q29 ON. And then the motor voltage supplied from Q29 changes to the voltage on playing. When pin 8 of IC5 becomes "H" Q29 ON→Q19 ON thus the governor (IC4) is activated and the motor voltage is regulated, hence the motors rotate at a constant speed.

Fast Forward
Pin 6 of IC5 "H"→Q22 ON→Q19 ON, and the motor current flows through Q19→Motor→Q22 and the motor rotates at high speed.

Rewind
When pin 12 of IC5 becomes "H" Q20 goes ON. Q18 also goes on, and the motor current flows through Q18→ Motor→Q20.
Because this is the reverse direction to the current which flows in the above Fast Forward mode, the motor rotates at high speed in the reverse direction.

Circuit Diagram



HOW TO REPLACE FLAT PACKAGE IC

■ PREPARATION

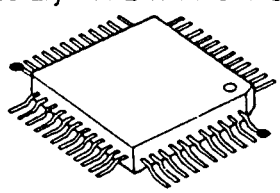
- SOLDER ..... Sparkle Solder 115A-1, 115B-1
  OR
  Almit Solder KR-19, KR-19RMA
- Soldering iron ..... Recomended power consumption will be between 30w to 40w.
  Temperature of Copper Rod 662 ±50° F (350 ±10° C)

  (An expert may handle 60~80w iron, but beginner might damage foil by overheating)
- Flux ..... HI115 Specific gravity 0.863

  (Original flux will be replaced daily.)

■ PROCEDURE

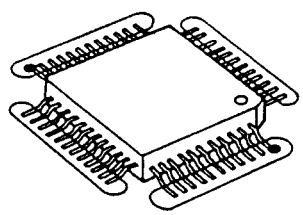
1. Temporary fix FLAT PACKAGE IC by Soldering on marked 2pins.



●.....Temporary soldering point.

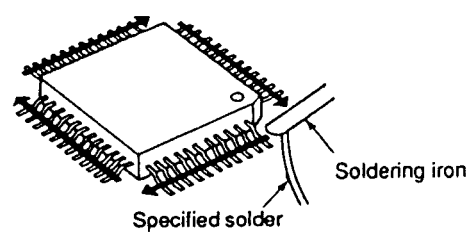
*Most important matter is accurate setting of IC to the corresponding soldering foil.

2. Apply flux for all pins of FLAT PACKAGE IC.



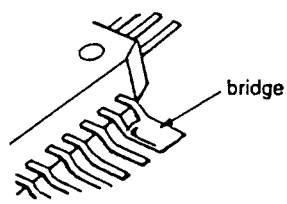
.....Flux

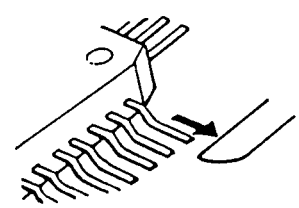
3. Solder employing specified solder to direction arrow, as slide the soldering iron.



■ MODIFICATION PROCEDURE OF BRIDGE

1. Re-solder slightly on bridging portion.
2. Remove remained solder along pins employing soldering iron as shown in below Figure.





TROUBLESHOOTING GUIDE

1) FLOW CHART for DECK

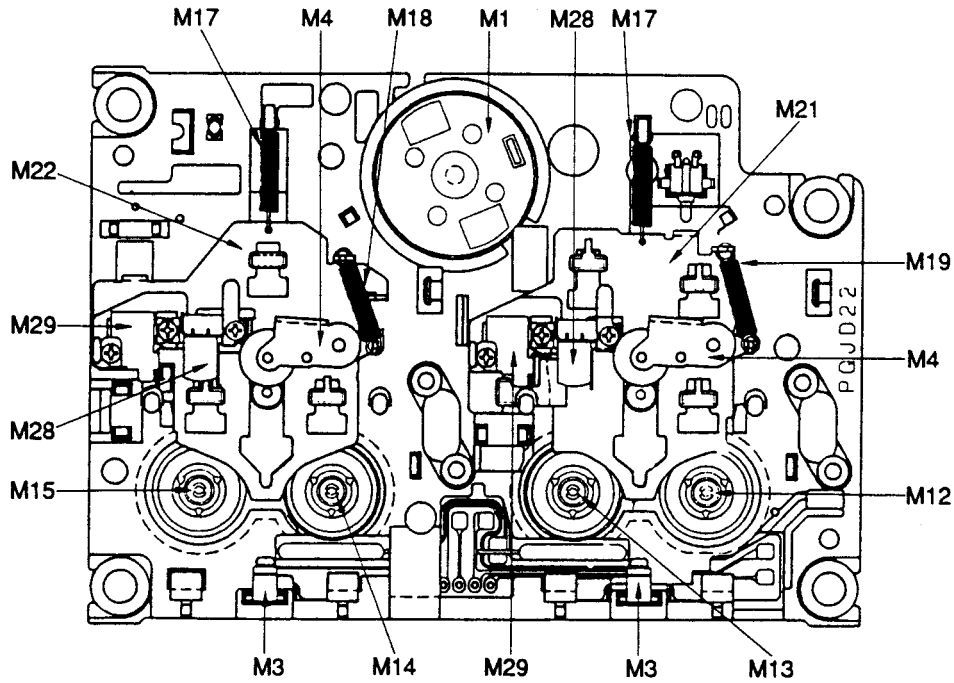


Fig. 10

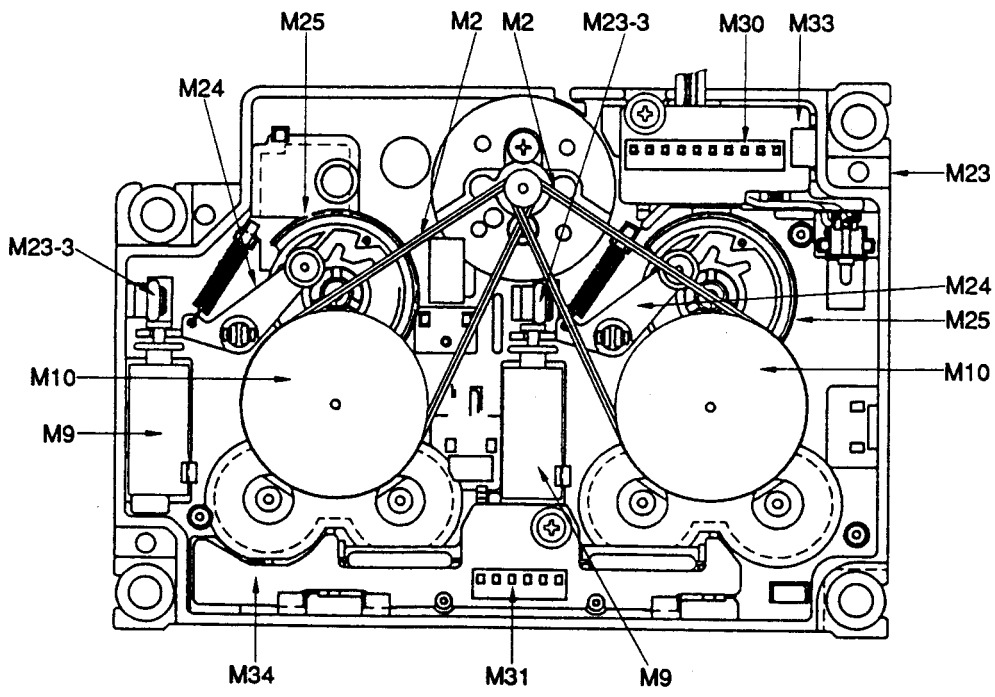
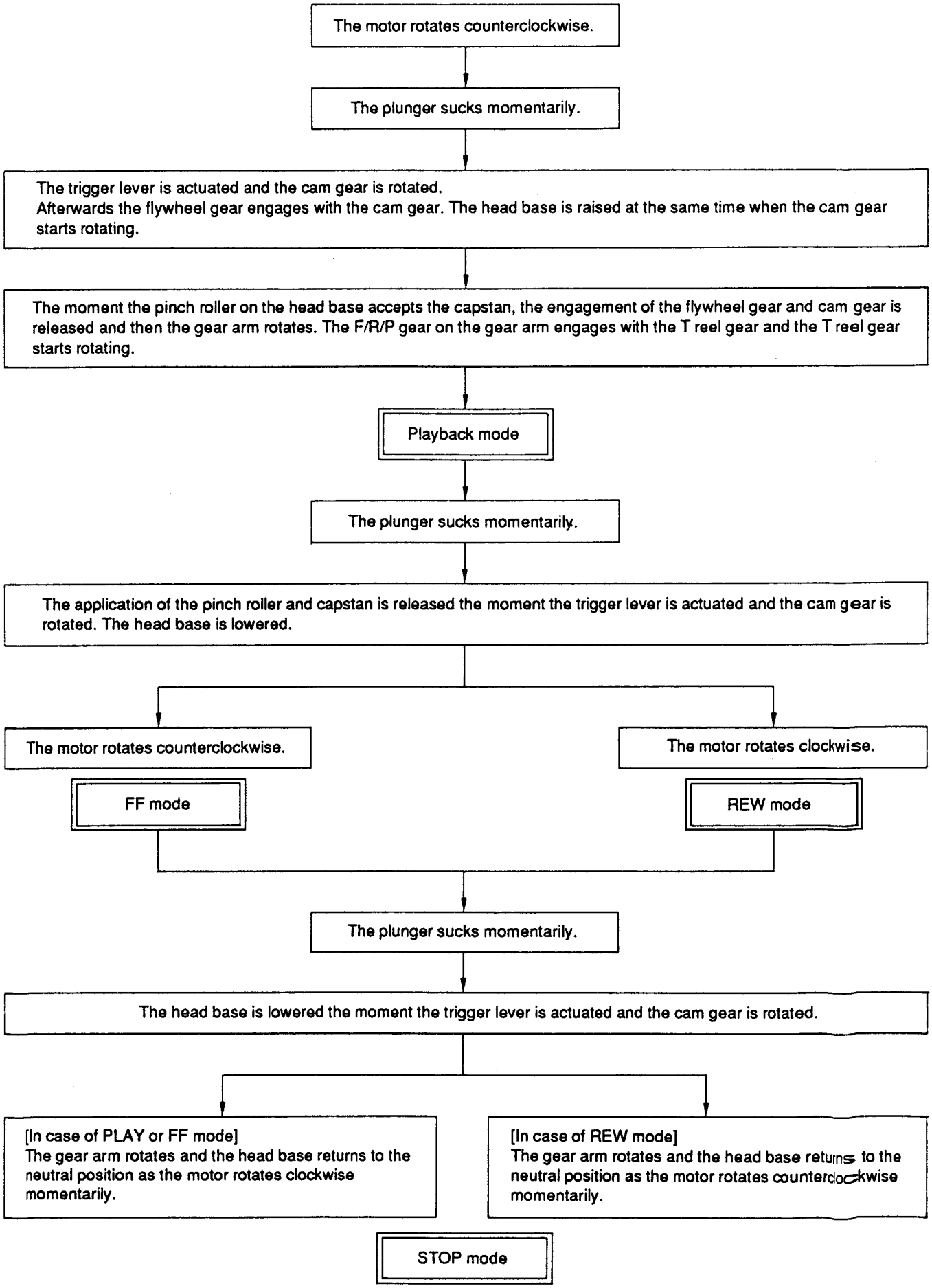


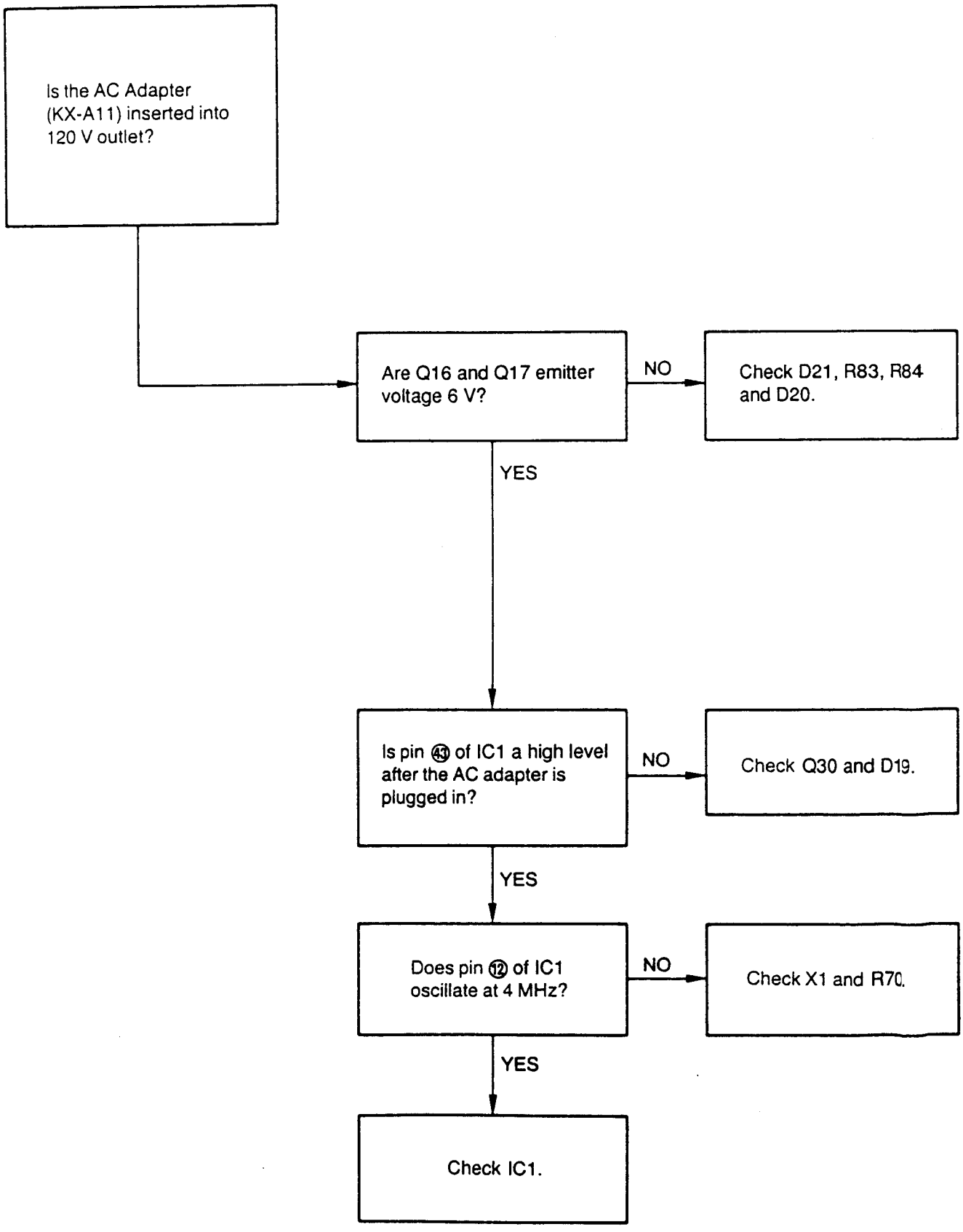
Fig. 11


The motor rotates counterclockwise.
The plunger sucks momentarily.
The trigger lever is actuated and the cam gear is rotated.
Afterwards the flywheel gear engages with the cam gear. The head base is raised at the same time when the cam gear starts rotating.
The moment the pinch roller on the head base accepts the capstan, the engagement of the flywheel gear and cam gear is released and then the gear arm rotates. The F/R/P gear on the gear arm engages with the T reel gear and the T reel gear starts rotating.
Playback mode
The plunger sucks momentarily.
The application of the pinch roller and capstan is released the moment the trigger lever is actuated and the cam gear is rotated. The head base is lowered.
The motor rotates counterclockwise.
FF mode
The motor rotates clockwise.
REW mode
The plunger sucks momentarily.
The head base is lowered the moment the trigger lever is actuated and the cam gear is rotated.
[In case of PLAY or FF mode]
The gear arm rotates and the head base returns to the neutral position as the motor rotates clockwise momentarily.
[In case of REW mode]
The gear arm rotates and the head base returns to the neutral position as the motor rotates counterclockwise momentarily.
STOP mode

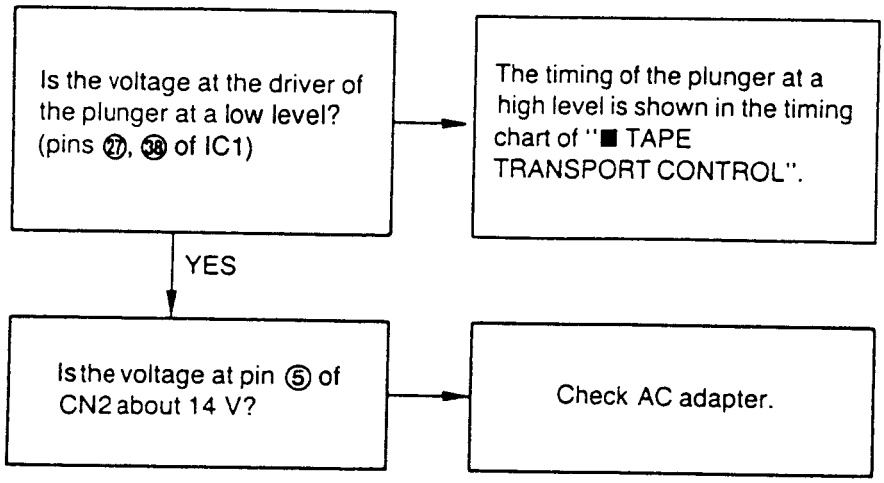
2) SERVICE HINTS

SYMPTOM	CURE
Unit will not respond to remote.	Check IC1.
Will not answer.	Check PC1.
OGM/ICM has distorted audio.	Check Speaker.
Would not record OGM and OGM stops after 3 second.	Check IC2.
Hangs up when OGM starts.	Check Q5. For bad solder joints.
Dead from factory.	Check R83, R84 and D20.
Will not record OGM end of message beep.	Check IC1 and IC2.
No remote function.	Check IC3.
Motor turns on and off constantly.	Check Q24, Q26.
OGM clicks on then off.	Check Q8 drive transistor.
ICM eats tapes.	Small belt off or is not on lower side of tension pulley.
No power.	Check R83 for open or heat also check D20 causing R84 to heat.
Plunger ICM (OGM) is not functioning.	Check Q24 and Q26.
Will not answer ring.	Check resistor PS1 and R2 coming apart from P.C. board.
OGM will not stay long enough.	Check solder contacts arround IC1 and IC2.
No function.	Check Q16 and Q17.

3) FUNCTIONS DO NOT OPERATE.

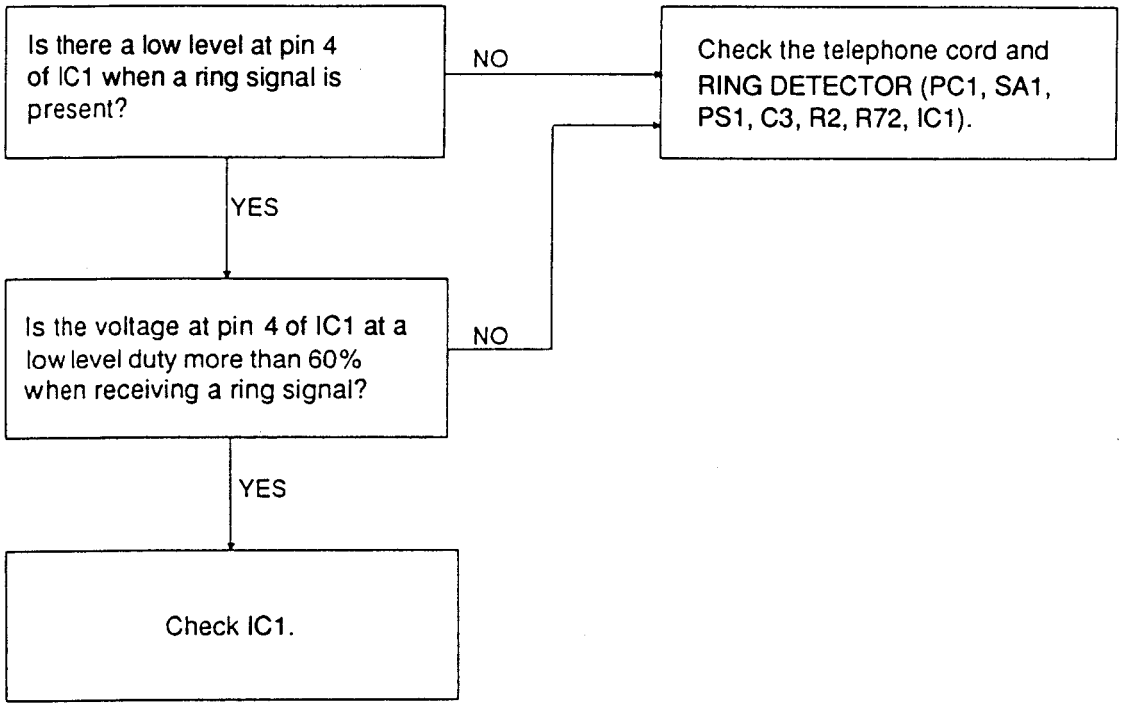

Is the AC Adapter (KX-A11) inserted into 120 V outlet?
Are Q16 and Q17 emitter voltage 6 V?
NO
Check D21, R83, R84 and D20.
YES
Is pin ㊸ of IC1 a high level after the AC adapter is plugged in?
NO
Check Q30 and D19.
YES
Does pin ⑫ of IC1 oscillate at 4 MHz?
NO
Check X1 and R70.
YES
Check IC1.

4) THE PULL OF PLUNGER IS POOR OR NONE AT ALL.


Is the voltage at the driver of the plunger at a low level? (pins ㉗, ㉘ of IC1)
The timing of the plunger at a high level is shown in the timing chart of "■ TAPE TRANSPORT CONTROL".
YES
Is the voltage at pin ⑤ of CN2 about 14 V?
Check AC adapter.

5) OGM END MARK DETECT
Check the Vox Circuit.

6) DOES NOT ANSWER TELEPHONE CALL


Is there a low level at pin 4 of IC1 when a ring signal is present?
NO
Check the telephone cord and RING DETECTOR (PC1, SA1, PS1, C3, R2, R72, IC1).
YES
Is the voltage at pin 4 of IC1 at a low level duty more than 60% when receiving a ring signal?
NO
YES
Check IC1.

7) •ICM CONTINUES TO RECORD AFTER THE CALLER HANGS UP.
•END OF MESSAGE IS CLIPPED WHEN CALLER HANGS UP.

When caller hangs up, the KX-T5100 can detect the following 4 signal type.

A. CPC pulse.
B. Dial tone or other continuous tones.
C. Silence.
D. Cycle signals.

A. Check CPC DETECTOR CIRCUIT (Q4, R9, R10, R11, PC1, R72, Q3, IC1)
B., C, D.
Check VOX DETECTOR CIRCUIT (pin 12 of IC2, pin 9 of IC1, C32, R39, Q8, C35, R43, D9, D10, R113).

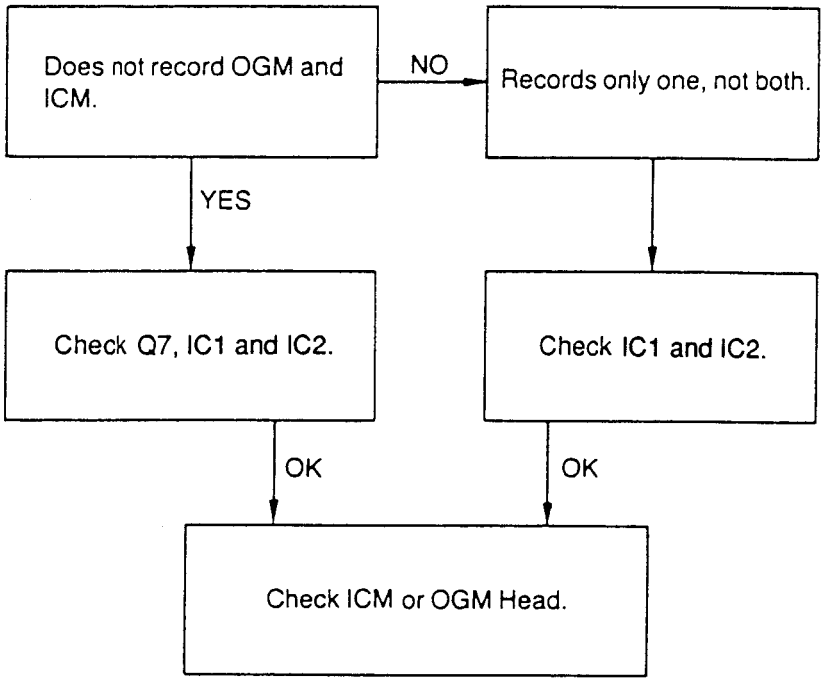
8) REMOTE CONTROLLER DOES NOT WORK OR RESPONSE IS POOR.
The following are considered for the causes of no remote reception:

A. The security code may not be the same as set on the unit.
B. High distortion in LINE OUTPUT CIRCUIT causing interference between the transmitting signal and the remote signal.
C. Excessive loss in telephone line.

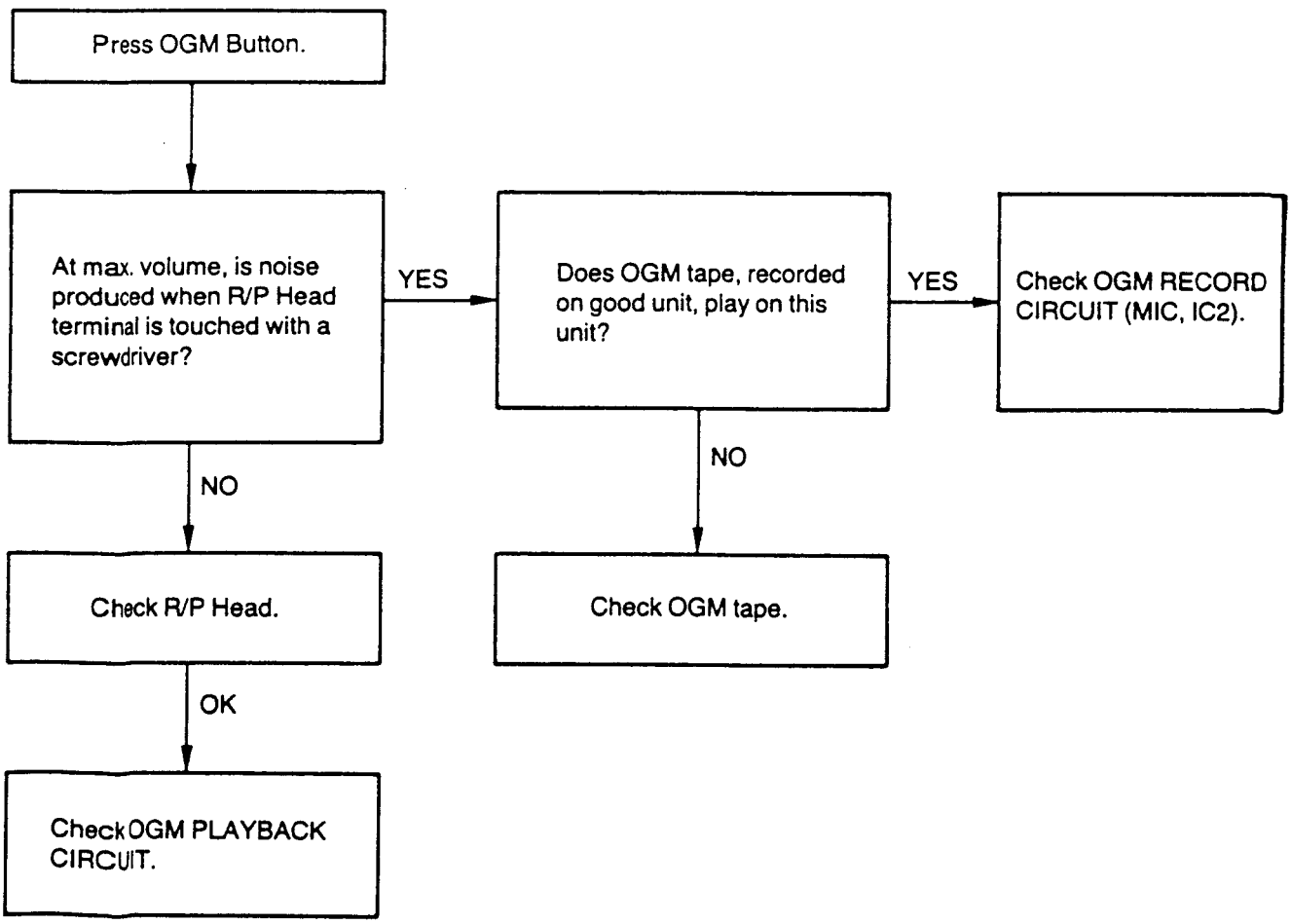
A. Check the security code of the unit.
B. Check LINE OUTPUT CIRCUIT (Q3, C7, C8).
C. Test on a telephone line known to be working properly.

If all of the above check N.G., check the remote signal detect circuit (IC1).

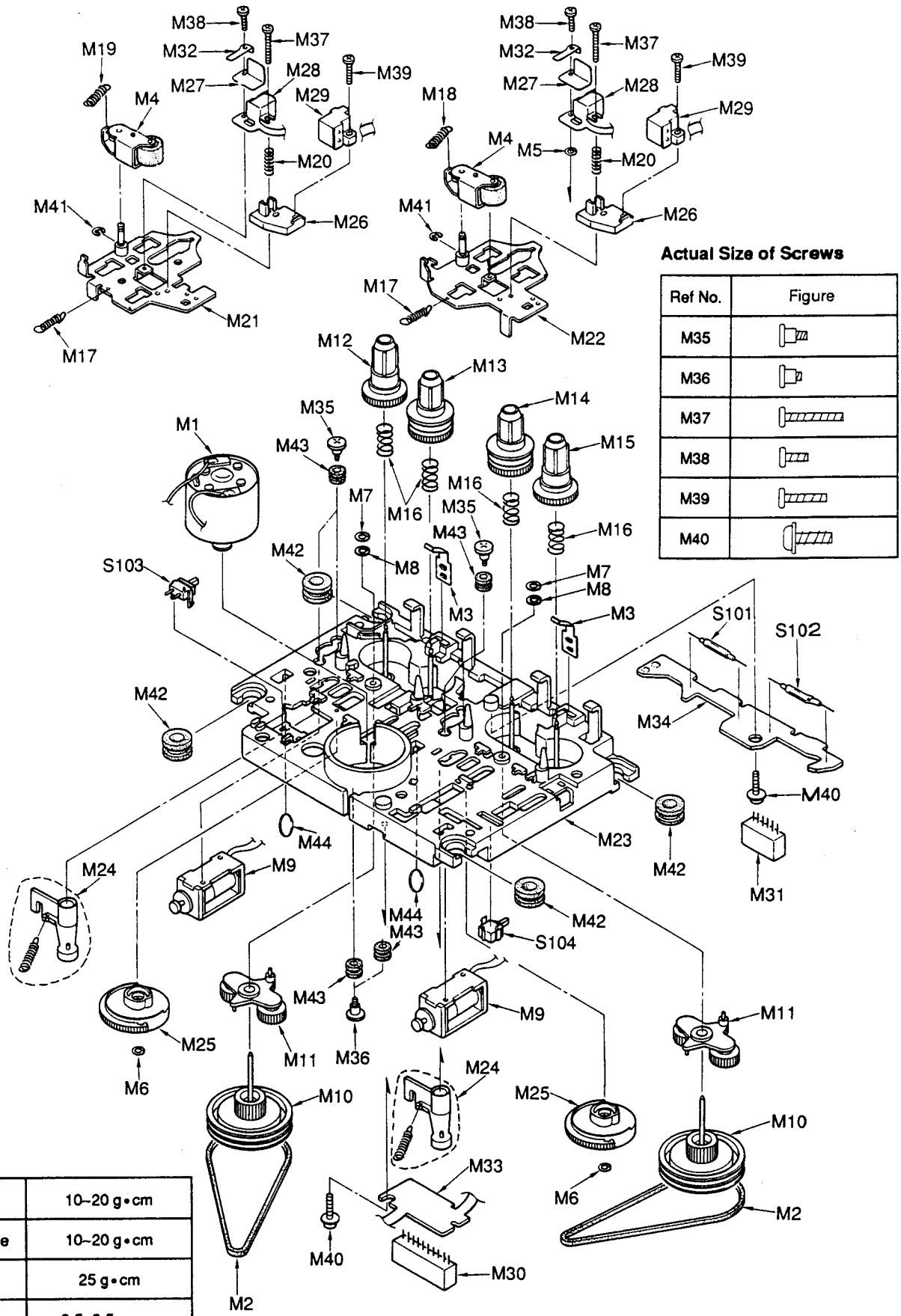
9) DOES NOT RECORD



10) NO OR LOW OGM PLAYBACK


Press OGM Button.
At max. volume, is noise produced when R/P Head terminal is touched with a screwdriver?
YES
Does OGM tape, recorded on good unit, play on this unit?
YES
Check OGM RECORD CIRCUIT (MIC, IC2).
NO
NO
Check R/P Head.
Check OGM tape.
OK
Check OGM PLAYBACK CIRCUIT.

CASSETTE DECK PARTS LOCATION



Actual Size of Screws

Ref No.	Figure
M35	
M36	
M37	
M38	
M39	
M40	

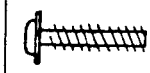
Specifications

Playback torque	10–20 g • cm
Fast forward torque	10–20 g • cm
Rewind torque	25 g • cm
Back tension	0.5–3.5 g • cm
Wow and flutter	0.65%

Fig. 12

CABINET AND ELECTRICAL PARTS LOCATION

Actual Size of Screws

Part No.	Figure
E4	
E5	
E6	

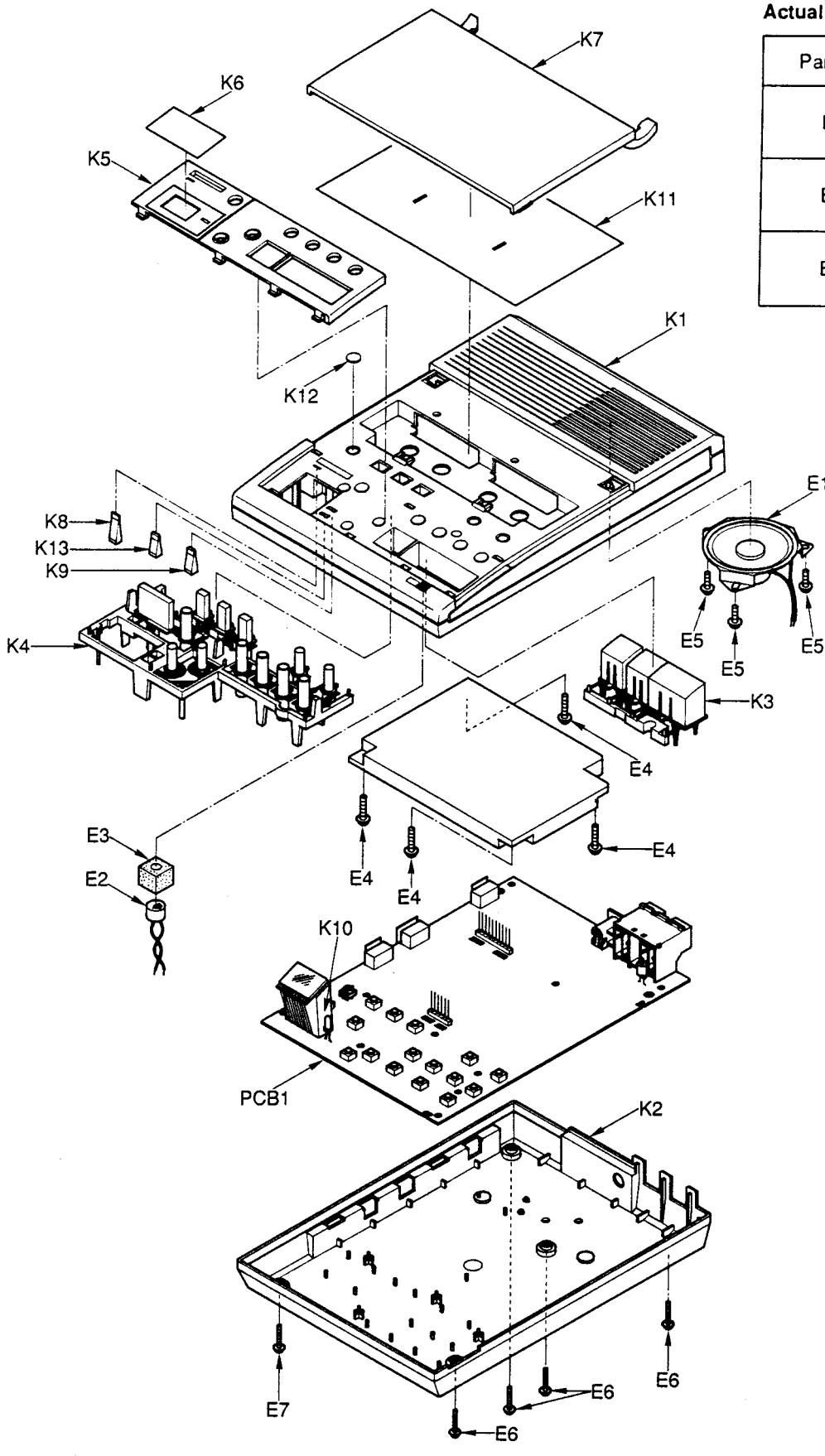


Fig. 13

EXTENSION CABLE CONNECTING METHOD

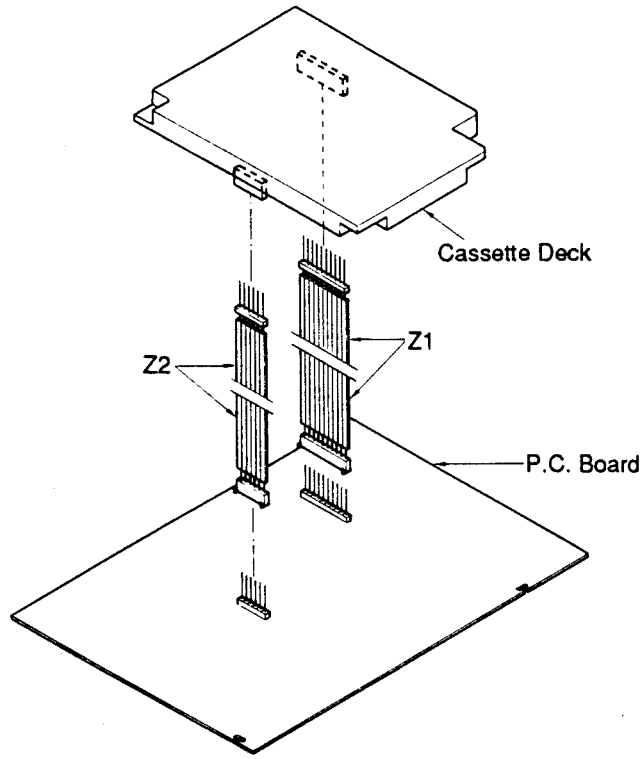


Fig. 14

ACCESSORIES AND PACKING MATERIALS

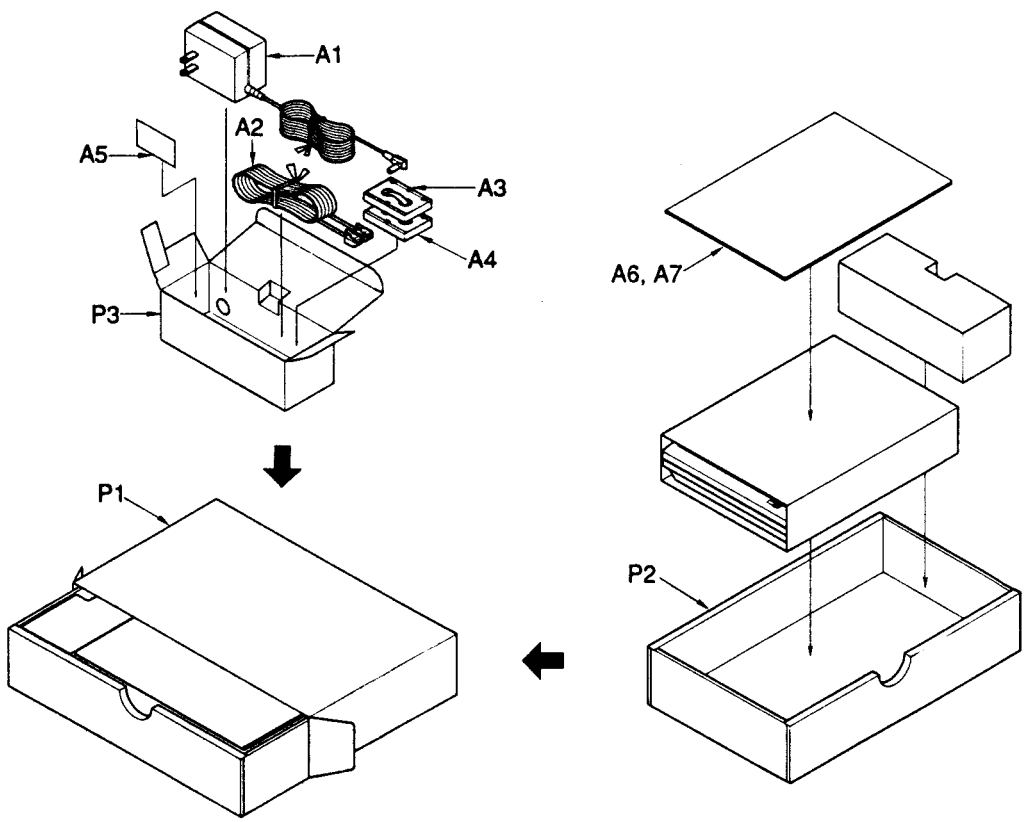


Fig. 15

REPLACEMENT PARTS LIST

Model KX-T5100

1. RTL (Retention Time Limited)

Note: The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

2. Important safety notice.

Components identified by the ⚠ mark special characteristics important for safety. when replacing any of these components, use only manufacture's specified parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

Unless otherwise specified.

All resistors are in ohms(Ω) k=1000Ω,M=1000kΩ

All capacitors are in MICRO FARADS(μF) P=μμF

*Type &Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyster
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

Ref. No.	Part No.	Part Name & Description	Pcs
		CASSETTE DECK PARTS	
M1	PQFMJD2200Z	MOTOR ASSEMBLY	1
M2	PQFB10002Z	ANGULAR BELT	2
M3	PQFD10009Z	LEAF SPRING	2
M4	PQFIJD2200Z	PINCH LEVER ASSEMBLY	2
M5	PQFN10002Z	WASHER	1
M6	PQFN16Z	WASHER	2
M7	PQFN33Z	WASHER	2
M8	PQFN49Z	WASHER	2
M9	PQFP10001Z	PLUNGER	2
M10	PQFFJD2200Z	FLYWHEEL ASSEMBLY	2
M11	PQFG1D2200Z	GEAR ARM ASSEMBLY	2
M12	PQFR1D2200Z	ICM TAKEUP REEL TABLE ASSEMBLY	1
M13	PQFR2D2200Z	ICM SUPPLY REEL TABLE ASSEMBLY	1
M14	PQFR3D2200Z	OGM TAKEUP REEL TABLE ASSEMBLY	1
M15	PQFR4D2200Z	OGM SUPPLY REEL TABLE ASSEMBLY	1
M16	PQFS10005Z	SPRING, BACK TENSION	4
M17	PQFS10007Z	SPRING, HEAD BASE	2
M18	PQFS10015Z	SPRING, OGM PINCH LEVER	1
M19	PQFS10016Z	SPRING, ICM PINCH LEVER	1
M20	PQFS73Z	SPRING, AZIMUTH	2
M21	PQFD1D2200Z	ICM HEAD BASE ASSEMBLY	1
M22	PQFD2D2200Z	OGM HEAD BASE ASSEMBLY	1
M23	PQFCJD2200Z	MECHANISM CHASSIS ASSEMBLY	1
M24	PQFYJD2200Z	TRIGGER LEVER ASSEMBLY	2
M25	PQFG2D2200Z	CAM GEAR ASSEMBLY	2
M26	PQFW10010Z	ERASE HEAD BASE	2
M27	PQHR321Z	INSULATOR	2
M28	PQJH1M2Y	P/R HEAD	2
M29	PQJH6M2Z	ERASE HEAD	2
M30	PQJS10B32Z	CONNECTOR, 10 PIN	1
M31	PQJS6B30Z	CONNECTOR, 6 PIN	1
M32	PQJT10029Y	TERMINAL	2
M33	PQUP10064Z	P. C. BOARD, FLEXIBLE	1
M34	PQUP10065Z	P. C. BOARD, REED SWITCH	1
M35	PQHD10006Z	SCREW, PLUNGER	4
M36	PQHD15Z	SCREW, MOTOR	2
M37	XSN17+10FN-3	SCREW, AZIMUTH	2
M38	XSN17+4FN-3	SCREW, R/P HEAD	2
M39	XSN17+7FN-A	SCREW, ERASE HEAD	2
M40	XTW26+6F	SCREW, P. C. BOARD	2
M41	XUC12FP-V	RETAINING RING	2
M42	PQFI10001Z	CUSHION, CHASSIS	4
M43	PQFI14Z	CUSHION, PLUNGER and MOTOR	6
M44	PQFE10001Z	RUBBER, RING	2
S101	PQSE17Y	REED SWITCH (ICM)	1
S102	PQSE17Y	REED SWITCH (OGM)	1
S103	PQSH1A52Z	SWITCH, POSITION (ICM)	1
S104	PQSH1A52Z	SWITCH, POSITION (OGM)	1
		CABINET PARTS	
K1	PQKM10006W1	UPPER CABINET	1
K2	PQYF10003Y1	LOWER CABINET	1
K3	PQBX10012Z1	BUTTON, STOP etc.	1
K4	PQBX10013X1	BUTTON, FF, REW etc.	1
K5	PQGG10002W1	GRILLE	1
K6	PQGP10003Y1	PANEL	1
K7	PQKK10004Y1	CASSETTE LID	1
K8	PQHR10016Z	SPACER, ANSWER LED	1
K9	PQHR10017Z	SPACER, IN USE LED	1
K10	PQHR10042Z	SPACER, LCD	1
K11	PQQT10143Y	INDICATION LABEL	1
K12	PQGX10003Z1	SHEET	1
K13	PQHR10038Z	SPACER, TIME LED	1
		ELECTRICAL PARTS	
E1	PQAS5P13Z	SPEAKER	1
E2	PQJM113Z	MICROPHONE	1
E3	PQMG10001Z	RUBBER, MICROPHONE COVER	1
E4	PQHD10009Z	SCREW	1
E5	XTW3+S10P	SCREW (3X10)	3
E6	XTW3+S16P	SCREW (3X16)	5
		ACCESSORIES	
A1	KX-A11	AC ADAPTOR	1⚠
A2	PQJA59V	TELEPHONE CORD	1⚠
A3	PQJN1M10AY	CASSETTE TAPE (10 MIN)	1
A4	PQJN1M30AY	CASSETTE TAPE (30 MIN)	1
A5	PQQW10043Z	DIAL CARD	1
A6	PQQW10042Y	QUICK REFERENCE GUIDE	1
A7	PQQX10037Y	INSTRUCTION BOOK	1
		PACKING MATERIALS	
P1	PQPK10120Y	GIFT BOX	1
P2	PQPN10027Z	CUSHION	1
P3	PQPN10028Y	ACCESSORY BOX	1
		FIXTURES AND TOOLS	
Z1	PQJS11K3Z	EXTENSION CORD, 11 PIN	1
Z2	PQJS6K2Z	EXTENSION CORD, 6 PIN	1
Z3	PQZZLCT2401A (or QZZCWAT)	TEST TAPE (See page 7)	1

Note:

1. PQJS11K3Z and PQJS6K2Z are useful for servicing. (They make servicing easy.)
2. PQZZLCT2401A (or QZZCWAT) are necessities for servicing.

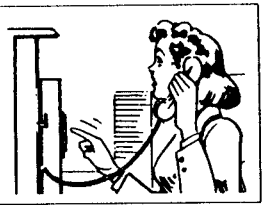
Ref. No.	Part No.	Part Name & Description		Pcs
		PRINTED CIRCUIT BOARD PARTS		
PCB1	PQWPT5100M	P. C. BOARD ASSEMBLY (RTL)		1
		(ICS)		
IC1	PQVI850FK134	IC		1
IC2	PQVISC79100P	IC		1
IC3	PQVICS10080N	IC		1
IC4	PQVIBA6220	IC		1
IC5	PQVITC7H04P	IC		1
		(TRANSISTORS)		
Q1	2SA1625	TRANSISTOR (SI) (or 2SA1776Q or 2SA1776P or 2SB1488P or 2SB1448Q)		1 ⚠
Q2	2SD662B	TRANSISTOR (SI)	S	1 ⚠
Q3	PQVTKSD261CY	TRANSISTOR (SI)		1
Q4	2SD1819A	TRANSISTOR (SI) (or 2SC4155S or 2SC4081S)		1
Q5	2SD1819A	TRANSISTOR (SI) (or 2SC4155S or 2SC4081S)		1
Q7	2SB1218A	TRANSISTOR (SI) (or 2SA1576S or 2SA1603S)		1
Q8	2SD1819A	TRANSISTOR (SI) (or 2SC4155S or 2SC4081S)		1
Q16	2SD2137	TRANSISTOR (SI)		1
Q17	2SD2136	TRANSISTOR (SI)		1
Q18	2SA854	TRANSISTOR (SI)	S	1
Q19	2SA854	TRANSISTOR (SI)	S	1
Q20	2SC1741S	TRANSISTOR (SI) (or 2SC2120)		1
Q22	2SC2120	TRANSISTOR (SI) (or 2SC2120)		1
Q24	2SC1741S	TRANSISTOR (SI) (or 2SC2120)	S	1
Q26	2SC2120	TRANSISTOR (SI) (or 2SC2120)	S	1
Q29	2SC1741S	TRANSISTOR (SI) (or 2SC2120)		1
Q30	2SB1218A	TRANSISTOR (SI) (or 2SA1576S or 2SA1603S)		1
		(DIODES)		
D1~4	PQVDS5688G	DIODE(SI)	S	4 ⚠
D5	MA4180	DIODE(SI)		1
D6	1SS131	DIODE(SI)	S	1
D9	1SS131	DIODE(SI)	S	1
D10	1SS131	DIODE(SI)	S	1
D12~15	1SS131	DIODE(SI)	S	4
D16	1SS119	DIODE(SI)	S	1
D17	MA4033	DIODE(SI)	S	1
D18	1SS119	DIODE(SI)	S	1
D19	1SS119	DIODE(SI)	S	1
D20	PQVDMTZ6R8	DIODE(SI)		1
D21	PQVDS5688G	DIODE(SI)		1
D22~25	1SS119	DIODE(SI)	S	4
D27	1SS131	DIODE(SI)	S	1
		(LEDS)		
LED2	LN31GCPHU	LED		1
LED3	LN21RCPHV	LED		1
LED4	LN21RCPHV	LED		1
		(JACK)		
JJ1	PQJJ3H001Z	JACK, TELEPHONE, DC IN		1 ⚠

Ref. No.	Part No.	Part Name & Description		Pcs
		(SWITCHES)		
S1	PQSS3A17Z	SWITCH, RECORDING TIME SELECTOR		1
S2	PQSS3A17Z	SWITCH, RING TIMES SELECTOR		1
S3	PQSS2A27Z	SWITCH, MESSAGE ALERT SELECTOR		1
S5	EVQ22405K	SWITCH, NEW MESSAGE PLAYBACK		1
S6	EVQ22405K	SWITCH, ALL MESSAGE PLAYBACK		1
S7	EVQ22405K	SWITCH, STOP		1
S8	EVQ22405K	SWITCH, VOLUME UP		1
S9	EVQ22405K	SWITCH, VOLUME DOWN		1
S10	EVQ22405K	SWITCH, ANSWER ON		1
S11	EVQ22405K	SWITCH, TIME CHECK.		1
S12	EVQ22405K	SWITCH, 2 WAY RECORDING		1
S13	EVQ22405K	SWITCH, MEMO		1
S14	EVQ22405K	SWITCH, REWIND/REVIEW		1
S15	EVQ22405K	SWITCH, FAST FORWARD/CUE		1
S16	EVQ22405K	SWITCH, TIME SET.		1
S17	EVQ22405K	SWITCH, REMOTE CODE		1
S18	Not Used			
S19	EVQ22405K	SWITCH, GREETING CHECK		1
S20	EVQ22405K	SWITCH, GREETING RECORD		1
S21	EVQ22405K	SWITCH, GREETING SELECT.		1
		(CONNECTORS)		
CN1	PQJP10A16Z	CONNECTOR, 10 PIN		1
CN2	PQJP06A15Z	CONNECTOR, 6 PIN		1
		(OTHERS)		
SA1	PQVDSAE310F1	VARISTOR (SURGE ABSORBER)	S	1 ⚠
VR1	EVNDXAA03B52	VARIABLE RESISTOR, 500Ω		1
X1	PQVBT3.58G8	CERAMIC FILTER	S	1
X2	PQVCL3276N6Z	CRYSTAL OSCILLATOR		1
X3	PQVBT7.68T1	CRYSTAL	S	1
LCD1	PQADP2K6011A	LIQUID CRYSTAL DISPLAY		1
PC1	PQVIPC814K	PHOTO ELECTRIC TRANSDUCER	S	1 ⚠
PS1	PQRPBC120N	THERMISTOR		1 ⚠
		(RESISTORS)		
R1	ERDFS1TJ470	47		1 ⚠
R2	ERD25TJ473	47K		1 ⚠
R3	PQ4R10XJ104	100K		1 ⚠
R4	PQ4R10XJ472	4.7K		1 ⚠
R5	Not Used			
R6	PQ4R10XJ473	47K		1
R7	PQ4R10XJ102	1K		1
R8	PQ4R10XJ153	15K		1
R9	ERDFS1TJ330	33		1
R10	ERDFS1TJ330	33		1
R11	PQ4R10XJ223	22K		1
R12	PQ4R10XJ393	39K		1
R13	PQ4R10XJ103	10K		1
R14	PQ4R10XJ682	6.8K		1
R15	PQ4R10XJ563	56K		1
R16	ERDS2TJ153	15K		1
R17	PQ4R10XJ223	22K		1
R18	PQ4R10XJ223	22K		1
R19	ERDS2TJ121	120		1
R20	PQ4R10XJ184	180K		1
R21	PQ4R10XJ333	33K		1
R22	PQ4R10XJ564	560K		1
R23	PQ4R10XJ824	820K		1
R24	PQ4R10XJ334	330K		1
R25	PQ4R10XJ334	330K		1
R26	ERDFS1TJ474	470K		1
R27	PQ4R10XJ393	39K		1
R28	ERDS2TJ393	39K		1
R29	PQ4R10XJ103	10K		1
R30	PQ4R10XJ473	47K		1
R31	PQ4R10XJ473	47K		1
R32	Not Used			
R33	Not Used			
R34	PQ4R10XJ103	10K		1
R35	PQ4R10XJ222	2.2K		1

Ref. No.	Part No.	Part Name & Description	Pcs
R36	PQ4R10XJ153	15K	1
R37	PQ4R10XJ334	330K	1
R38	PQ4R10XJ223	22K	1
R39	PQ4R10XJ103	10K	1
R40	PQ4R10XJ181	180	1
R41	PQ4R10XJ105	1M	1
R42	PQ4R10XJ102	1K	1
R43	PQ4R10XJ563	56K	1
R44	PQ4R10XJ564	560K	1
R45	PQ4R10XJ473	47K	1
R46	PQ4R10XJ473	47K	1
R47	PQ4R10XJ473	47K	1
R48	PQ4R10XJ473	47K	1
R49	PQ4R10XJ473	47K	1
R50	PQ4R10XJ473	47K	1
R51	PQ4R10XJ473	47K	1
R52	PQ4R10XJ473	47K	1
R53~58	Not Used		
R59	PQ4R10XJ562	5.6K	1
R60~62	Not Used		
R63	ERDS2TJ562	5.6K	1
R64	Not Used		
R65	Not Used		
R66	PQ4R10XF9101	9.1K	1
R67	PQ4R10XJ272	2.7K	1
R68	PQ4R10XJ222	2.2K	1
R69	PQ4R10XJ152	1.5K	1
R70	Not Used		
R71	PQ4R10XJ104	100K	1
R72	PQ4R10XJ123	12K	1
R73	PQ4R10XJ473	47K	1
R74	ERDS2TJ331	330	1
R75	PQ4R10XJ821	820	1
R76	PQ4R10XJ102	1K	1
R77	PQ4R10XJ333	33K	1
R78~81	Not Used		
R82	PQ4R10XJ183	18K	1
R83	PQRQ1VJ4R7	4.7	1
R84	ERDS1TJ391	390	1
R85	PQ4R10XJ683	68K	1
R86	PQ4R10XJ104	100K	1
R87	ERDS2TJ561	560	1
R88	ERDS2TJ102	1K	1
R89	ERDS2TJ821	820	1
R90	PQ4R10XJ221	220	1
R91	ERDS2TJ151	150	1
R92	ERDS2TJ821	820	1
R93	PQ4R10XJ102	1K	1
R94	Not Used		
R95	ERD25TJ821	820	1
R96~98	Not Used		
R99	ERDS2TJ102	1K	1
R100~103	Not Used		
R104	ERDS2TJ102	1K	1
R105	PQ4R10XJ683	68K	1
R106	PQ4R10XJ683	68K	1
R107	Not Used		
R108	PQ4R10XJ473	47K	1
R109	PQ4R10XJ223	22K	1
R110	PQ4R10XJ223	22K	1
R111	PQ4R10XJ223	22K	1
R112	PQ4R10XJ223	22K	1
R113	PQ4R10XJ473	47K	1
R114~116	Not Used		
R117	ERD25TJ821	820	1
R118	PQ4R10XJ392	3.9K	1
R119	ERD25TJ473	47K	1
R120	ERD25TJ473	47K	1
R121	PQ4R10XJ473	47K	1
R122	Not Used		
R123	PQ4R10XJ473	47K	1
R124	PQ4R10XJ473	47K	1
R125	PQ4R10XJ105	1M	1
R126	ERDS2TJ103	10K	1
R127	PQ4R10XJ224	220K	1
R128	PQ4R10XJ104	100K	1
R129	PQ4R10XJ473	47K	1
R130	PQ4R10XJ104	100K	1
R131	ERDS2TJ473	47K	1
		(CAPACITORS)	
C1	ECKD2H681KB	680P	1 ⚠
C2	ECKD2H681KB	680P	1 ⚠
C3	ECQE2224KF	0.22	1 ⚠
C4	ECEA1HU3R3	3.3	1
C5	ECEA1CU221	220	1
C6	ECEA1HKS010	1	1
C7	PQCUV1H103KB	0.01	1
C8	PQCUV1H103KB	0.01	1
C9	PQCUV1H103KB	0.01	1
C10	PQCUV1H682KB	0.0068	1
C11	ECEA1EU470	47	1
C12	PQCUV1E333MD	0.033	1
C13	PQCUV1H152KB	0.0015	1
C14	PQCUV1H103KB	0.01	1
C15	ECKTAE103ZF	0.01	1
C16	ECEA1HU220	22	1
C17	ECEA1HU100	10	1
C18	ECEA1HU100	10	1
C19	ECEA1VU330	33	1
C20	PQCUV1H471JC	470P	1
C21	PQCUV1H103KB	0.01	1
C22	ECEA1AU101	100	1
C23	PQCUV1H102J	0.001	1
C24	PQCUV1H102J	0.001	1
C25	Not Used		
C26	ECEA1CKS100	10	1
C27	PQCUV1H223KB	0.022	1
C28	PQCUV1H103KB	0.01	1
C29	PQCUV1H153KB	0.015	1
C30	PQCUV1H681JC	680P	1
C31	ECEA1HUR47	0.47	1
C32	PQCUV1H103KB	0.01	1
C33	ECEA1HU2R2	2.2	1
C34	PQCUV1H681JC	680P	1
C35	PQCUV1H153KB	0.015	1
C36	ECEA1HKS0R1	0.1	1
C37	ECEA1HU100	10	1
C38	PQCUV1H103KB	0.01	1
C39	Not Used		
C40	Not Used		
C41	Not Used		
C42	PQCUV1H223KB	0.022	1
C43	Not Used		
C44	PQCUV1E473MD	0.047	1
C45	ECEA1EU4R7	4.7	1
C46	Not Used		
C47	Not Used		
C48	Not Used		
C49	PQCUV1H103KB	0.01	1
C50	ECEA1CKS470	47	1
C51	PQCUV1E104MD	0.1	1
C52	Not Used		
C53	ECEA1EU470	47	1
C54	EECW5R5D473	0.047	1
C55	PQCUV1H103KB	0.01	1
C56	Not Used		
C57	ECEA1EU470	47	1
C58	PQCUV1H103KB	0.01	1
C59	Not Used		
C60	ECEA1CK101	100	1
C61	PQCUV1H180JC	18P	1
C62	PQCUV1H200JC	20P	1
C63	PQCUV1H103KB	0.01	1
C64	PQCUV1E104MD	0.1	1
C65	PQCUV1H103KB	0.01	1
C66	PQCUV1H103KB	0.01	1

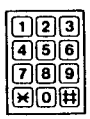
OPERATIONS

1 Call your unit from a touch tone telephone.



2 Press your remote code number during greeting message playback.

— A beep sounds to tell you the number of new messages up to 8 times.



Remote code no.

3

GHI 4 **To play back new messages only**

Press 4 button.

— The unit plays back only the messages that were recorded since the last time you retrieved.

JKL 5 **To play back all messages**

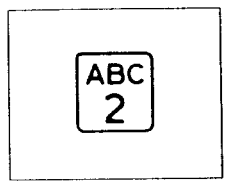
Press 5 button.

— The unit plays back all the recorded messages.

3 beeps sound at the end of playback.

4 Hang up. The messages are saved.

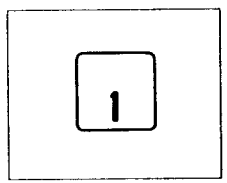
During playback



To skip the tape

Press 2 button.

— The unit skips the tape for a few seconds during playback and starts playback.

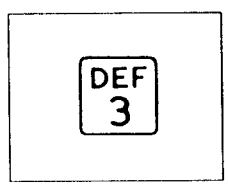


To back space the tape

Press 1 button.

— The unit rewinds the tape for a few seconds during playback and starts playback.

To reset the tape after playback



Press 3 button.

— When you played back all messages, the unit rewinds the tape to the beginning.
— When you played back only new messages, the unit rewinds the tape to the beginning of new messages.
— A beep sounds after rewinding tape.

If you want to rewind the tape to the beginning after played back only new messages:

Press 3 button again after hearing a beep (the tape has been reset).

— The unit rewinds the tape to the beginning.

If you want to cancel resetting of the tape:

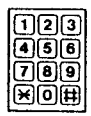
Press 2 button after hearing a beep (the tape has been reset).

Advanced remote operation

1 Call your unit from a touch tone telephone.

2 Press your remote code number during greeting message playback.

— A beep sounds to tell you the number of new messages up to 8 times.



Remote code no.

To skip the greeting message (For outside caller)

Press [*] button during greeting message playback.

— Callers can record their messages without listening to your greeting message.

3

To re-record the greeting message

① Press [7] button to re-record first greeting message.

Press [8] button to re-record second greeting message.

— The unit rewinds the greeting message tape to the beginning.

② Speak immediately after a long beep.

— Do not pause for over 5 seconds, or 6 beeps sound and the recording results in failure. Start again from step ① within 10 seconds after hearing 6 beeps.

③ To stop recording, press [9] button.

— The newly recorded greeting message will be played back.

— When you want to re-record, start again from step ①.

To change the greeting message from first to second

Press [*] [2] button.

To change the greeting message from second to first

Press [*] [1] button.

— The selected greeting message is played back.

To monitor the room sound

Press [6] button.

— You can monitor the sound in the room where the unit is installed for 30 seconds.

— A beep sounds after 30 seconds.

If you want to monitor again after the time-out has come:

Press [6] button again within 10 seconds of hearing the beep.

4 Hang up to end the remote operation.

Y (F)
KXT510x M
Printed in Japan